The Mining Journal

LONDON, APRIL 18, 1958

Vol. 250. No. 6400. Price Ninepence

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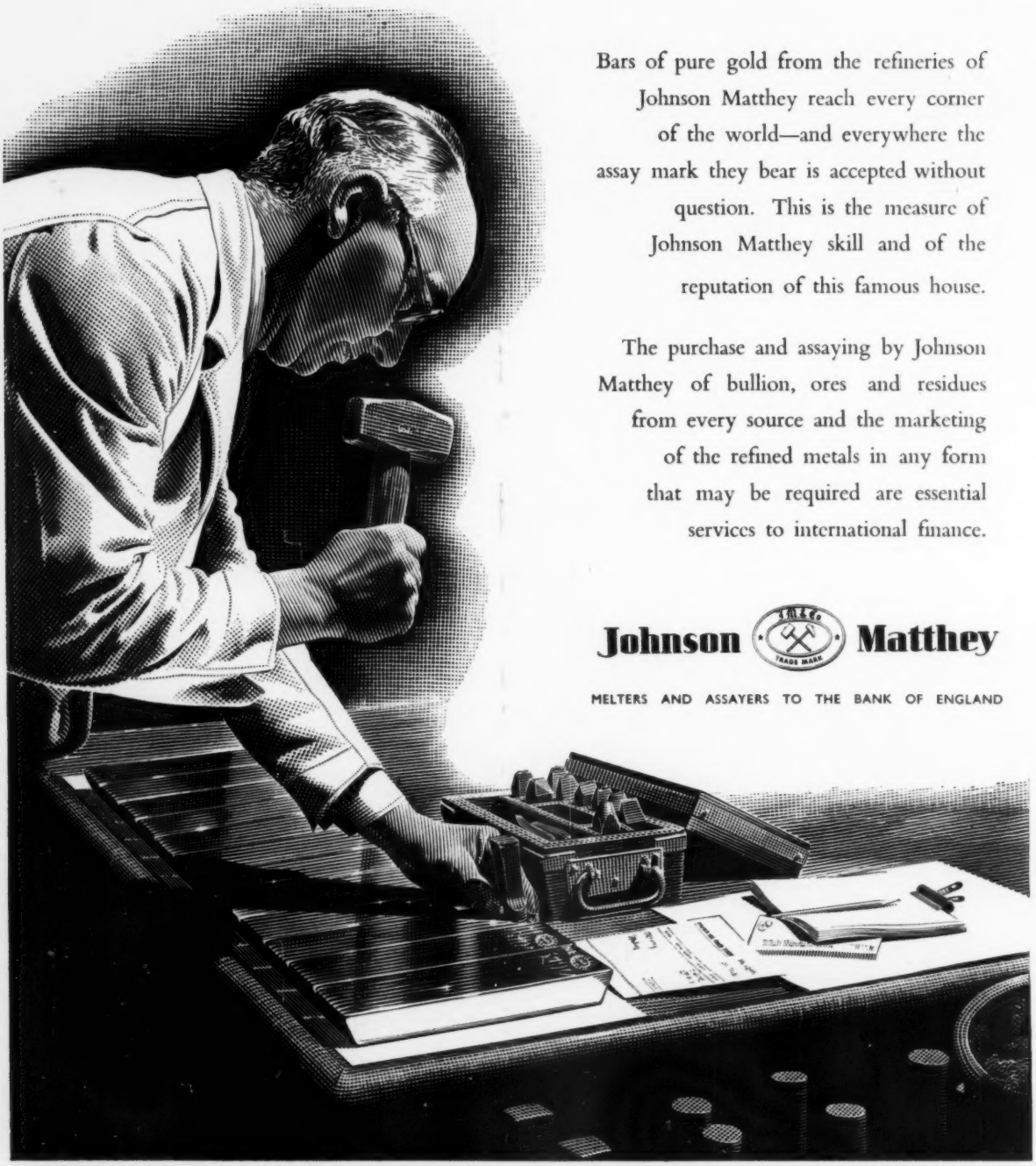

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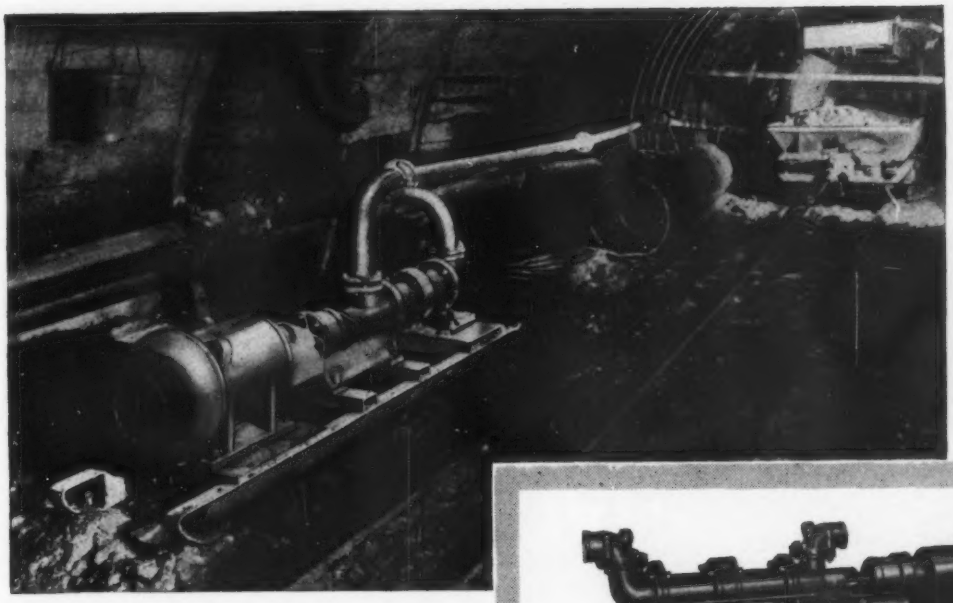

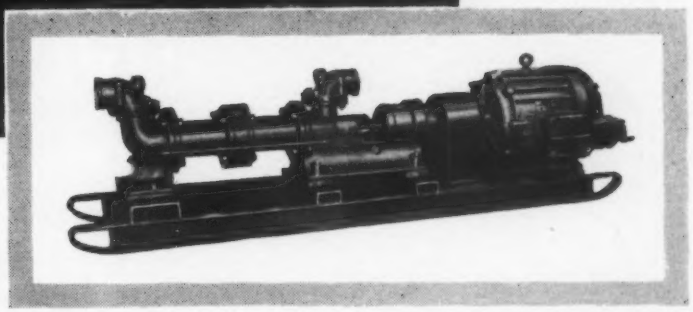

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D2B	1"	1450	G.P.H.	320	280	240
			Motor H.P.	¾	¾	¾
D3	1½"	1450	G.P.H.	500	440	375
			Motor H.P.	¾	¾	¾
D4	1½"	1450	G.P.H.	1250	1100	950
			Motor H.P.	1½	1½	1½
D6	2"	1450	G.P.H.	3250	3000	2500
			Motor H.P.	3	3	4
D10	3"	960	G.P.H.	5500	5000	4500
			Motor H.P.	4	5	7½
D12	3"	960	G.P.H.	7500	6500	5750
			Motor H.P.	5	7½	10
OTHER CAST IRON PUMPS						
*A2	¾"	1450	G.P.H.	150	120	—
			Motor H.P.	½	½	—

TWO-STAGE PUMPS

Size of Pump	Suction and Delivery Branches	R.P.M.		Total Head Feet of Water 100	200	300
D2D	¾"	1450	G.P.H.	150	130	110
			Motor H.P.	1	1	1
D3D	1½"	1450	G.P.H.	525	475	375
			Motor H.P.	1½	1½	1½
D4D	1½"	1450	G.P.H.	1300	1150	1000
			Motor H.P.	3	3	3
D6D	2"	1450	G.P.H.	3000	2750	2500
			Motor H.P.	4	5	7½
D10D	3"	960	G.P.H.	5700	5300	4800
			Motor H.P.	7½	10	12½
D12D	3"	960	G.P.H.	8000	7300	6500
			Motor H.P.	12½	17½	25
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			Motor H.P.	¾	¾	—

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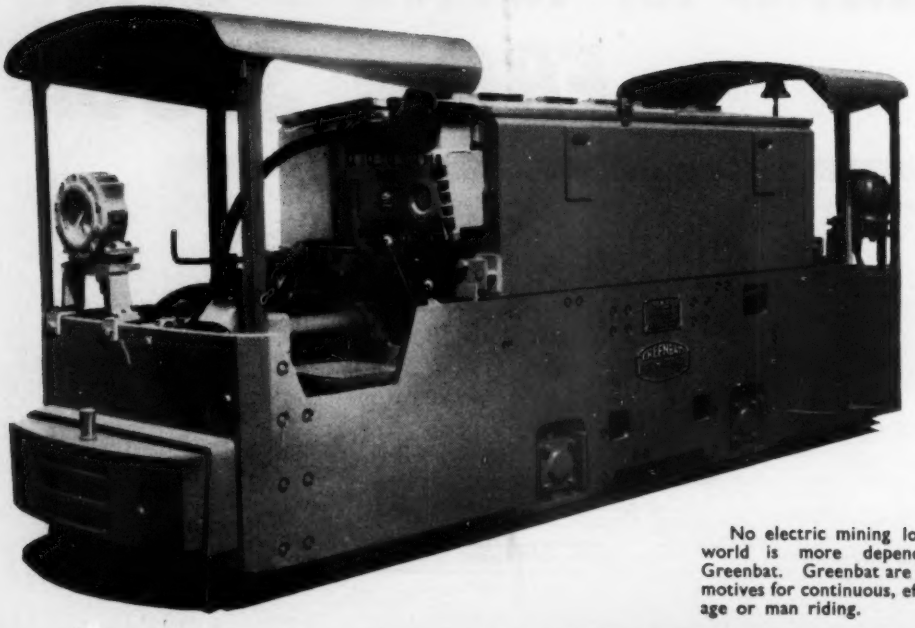

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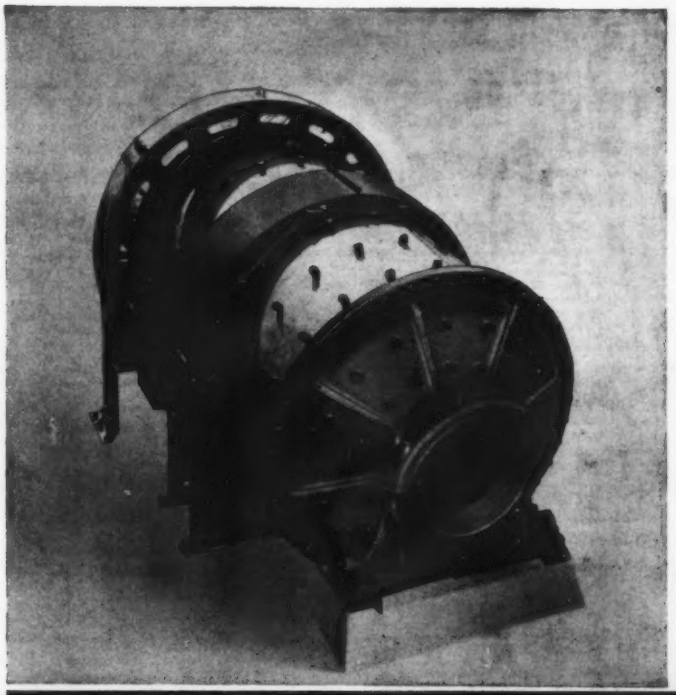

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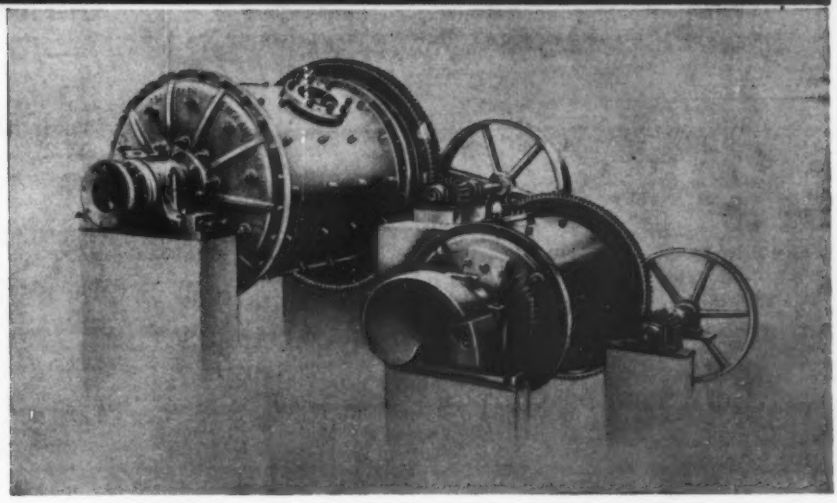

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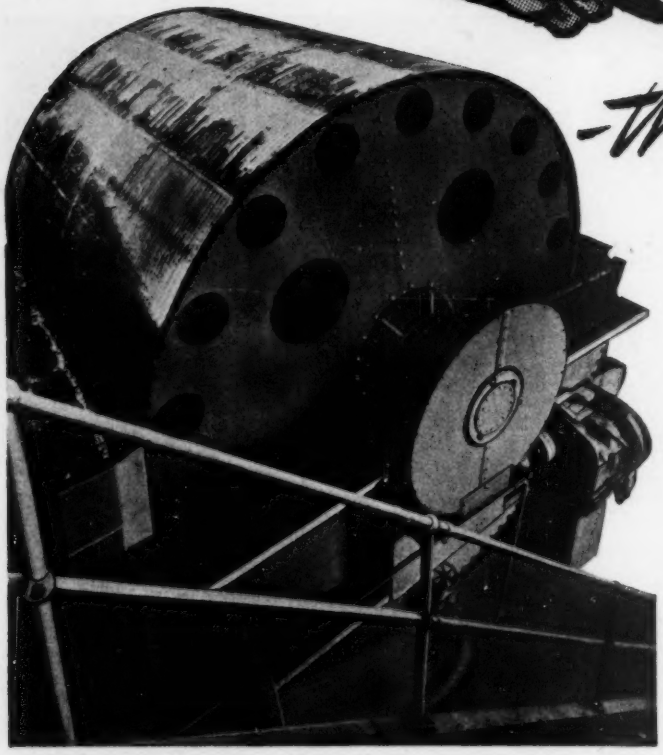

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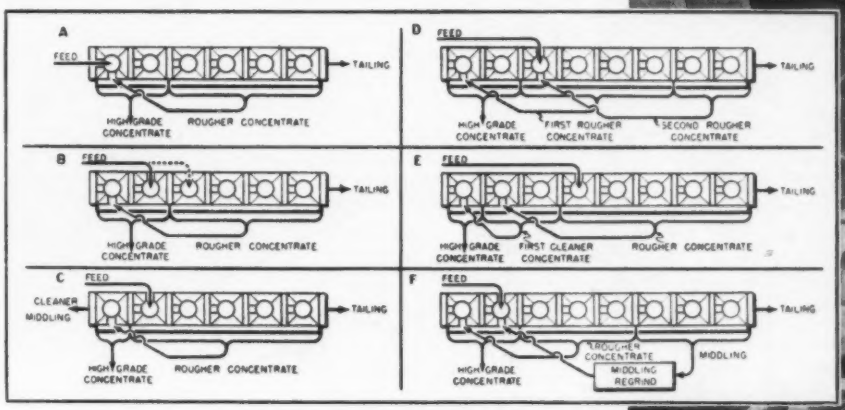

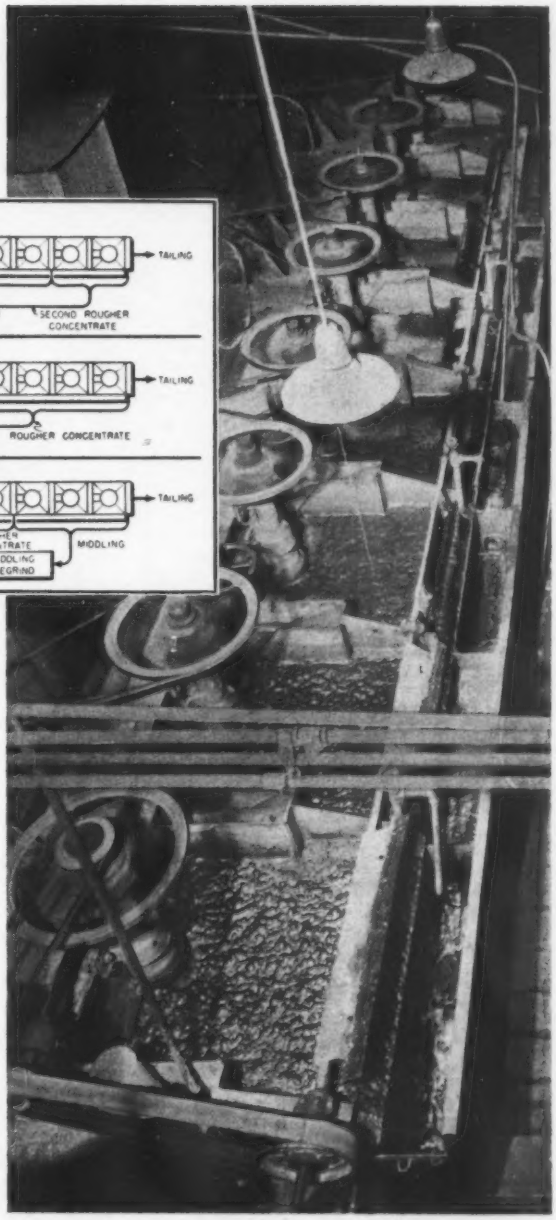

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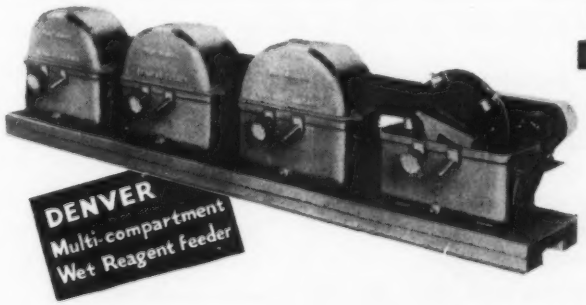

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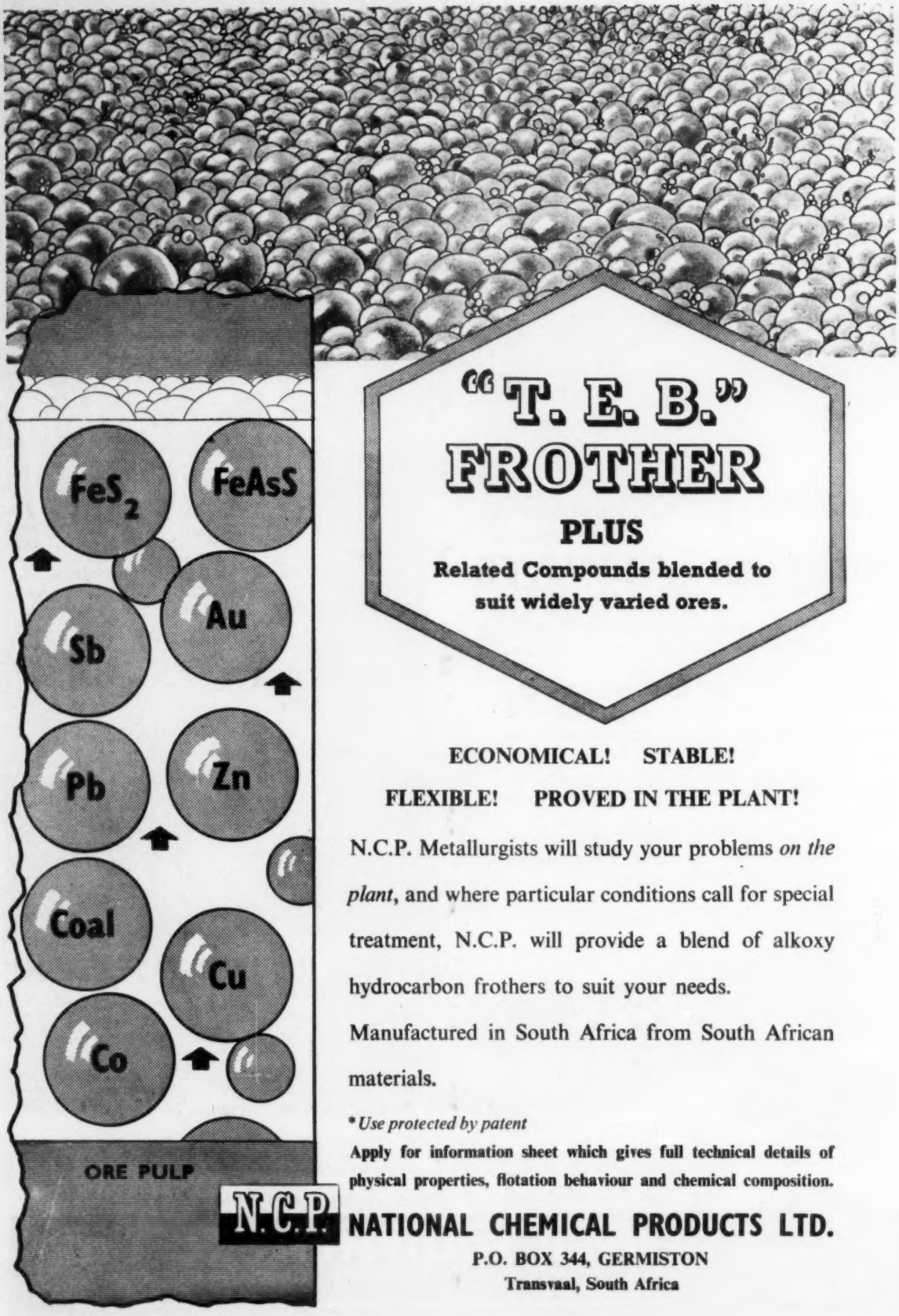

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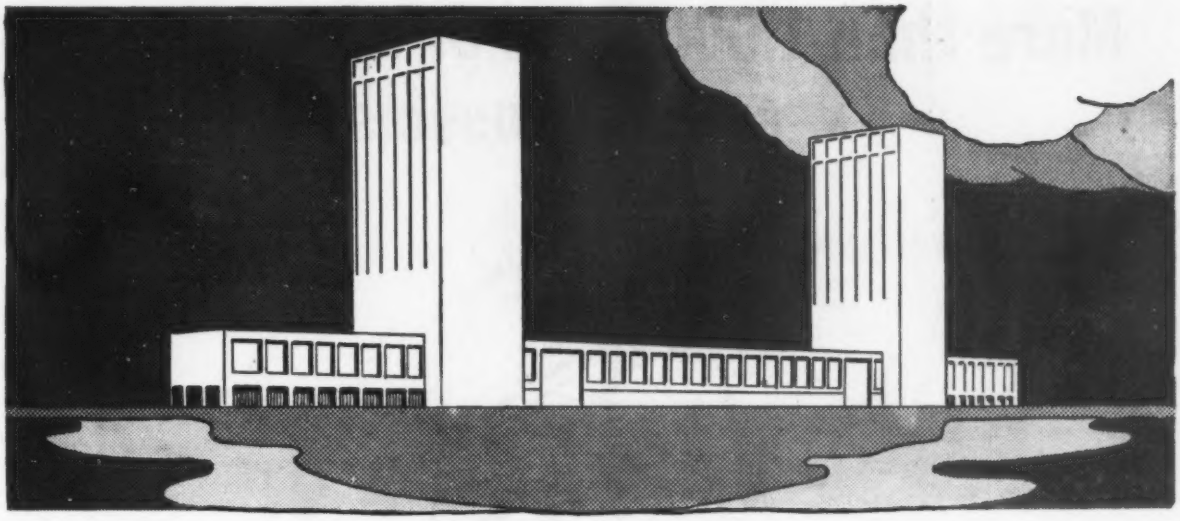

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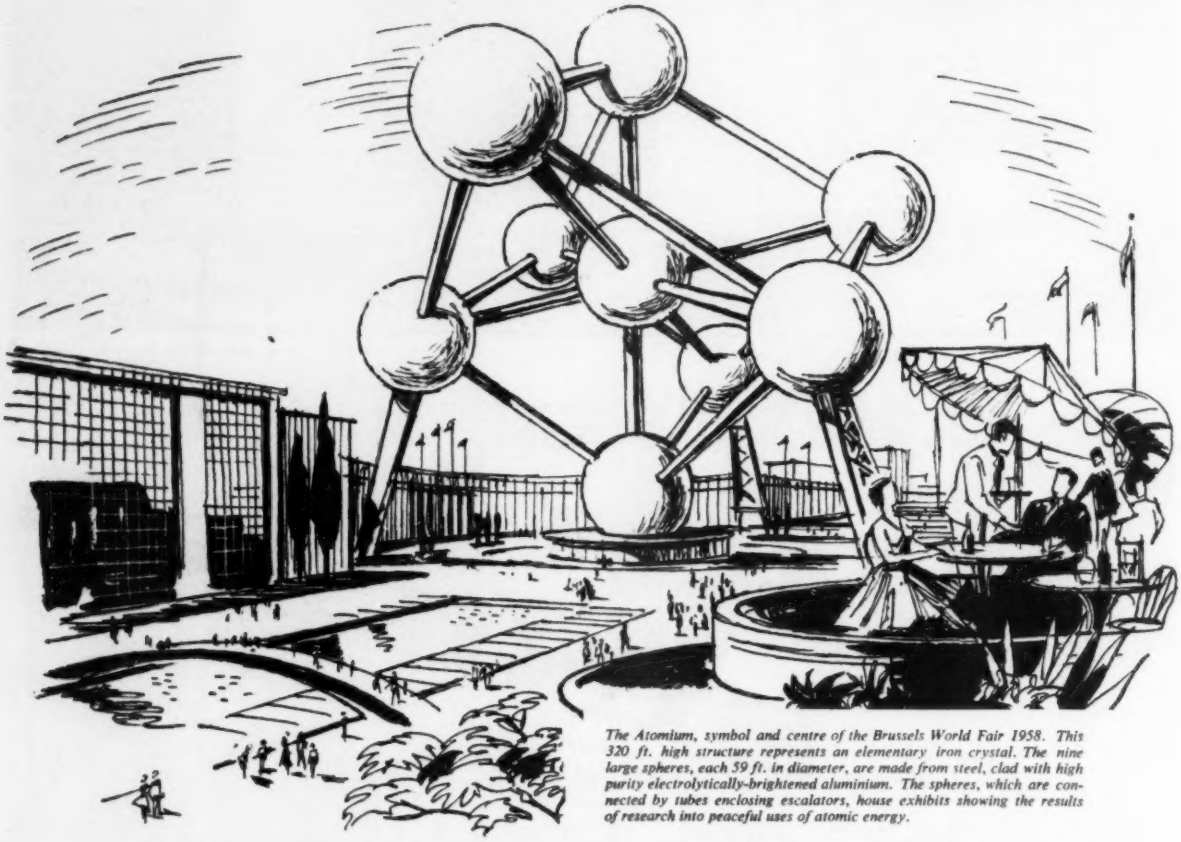

The Atomium, symbol and centre of the Brussels World Fair 1958. This 320 ft. high structure represents an elementary iron crystal. The nine large spheres, each 59 ft. in diameter, are made from steel, clad with high purity electrolytically-brightened aluminium. The spheres, which are connected by tubes enclosing escalators, house exhibits showing the results of research into peaceful uses of atomic energy.

Aluminium is once again proving itself to be the Metal of the Age in this era of scientific adventure. Architects and designers of many nations are using this strong, light, corrosion-resistant metal with imagination and ingenuity at the Brussels World Fair in the national pavilions and exhibition halls. Here are just a few examples:

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Aluminium span windows, stairway and external doors.

BRITISH PAVILION
30 tons of NORAL aluminium used for the roof.

AMERICAN PAVILION
Aluminium extrusions used to support transparent plastic roof.

RUSSIAN PAVILION
340 tons of aluminium sheet and extrusions used in the roof.

SPANISH PAVILION
Aluminium window frames.

TURKISH PAVILION
Aluminium roof.

PALAIS DES TRANSPORT
150 tons of aluminium used in the roof structure.

PALAIS II
About 70 tons of aluminium used for the anodised facade.

PALAIS DE L'ELECTRICITE
An aluminium facade.

ROAD TRANSPORT VIADUCT
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The Mining Journal

London, April 18, 1958

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South Africa After the Elections

THE South African elections look like turning out much as forecast. As we go to press, the Nationalists have already won 69 seats against the Opposition's 49, but of the remaining 38 results still to come in, practically all are from country districts, which can be relied upon to vote solidly for the government. The size of the majorities always promised to be of more interest than the result itself, which was in any event a foregone conclusion. There has been an exceptionally heavy poll—about 90 per cent—in which the Nationalists appear generally to have improved on their previous performances. If, as seems likely, this proves to be the pattern of the results yet to come in, this election will be a severe disappointment to those who looked for any signs of apathy among government supporters.

There is no doubt that of late some of the more forward looking Nationalist supporters have become concerned at the negative results achieved by their party's racial policies. Now, however, it has been made clear that such anxieties are far from infecting the rank and file of government supporters, and it remains to be seen how far these dawning doubts will influence the post-election realignment of sentiment within both major parties.

Certainly the present mounting tension of race relations, coupled with the manifest impracticability of *apartheid* as an economic concept, points sufficiently clearly to the need for a fresh approach to South Africa's domestic policies for it to be reasonable to anticipate divergencies of opinion within the Nationalist Party —divergencies which can be more readily debated once the elections are out of the way. Mr. Strydom's health has been in question for some time and if, as has been widely suggested, he were now soon to retire, some people in the Union would not discount the possibility of a substantial moderate group developing within the Party which might well provide the basis for some future coalition to which many United Party supporters would feel able to give allegiance.

The need for fundamental re-thinking on racial policies has been underlined by the unexpected defeat in a by-election this week, of the new Prime Minister of Southern Rhodesia, Sir Edgar Whitehead. His forthright comments on what may befall Northern Rhodesia if Federation is not made to work provides food for thought for all whites in Southern Africa.

Meanwhile, the Nationalists are clearly in power again in the Union for some years, and with a new mandate may now be more ready to attend to some of the problems of the gold industry calling for fiscal changes which may not be politically popular. Of these the most pressing is what to do about the marginal mines both from the point of view of the industry itself and also from the point of view of the continued economic well-being of the communities which have been built up around them. There are also a number of longer term tax problems which the government could usefully be pondering now rather than under the pressure of events at a later date.

As regards the marginal mines, the joint committee, set up by the government to examine the problem, presented its report some four months ago, and it is hard to see why the government should

have delayed so long in acting upon it unless it has been waiting to assess the shape of things to come in the American economy. It is conceivable that by next autumn the U.S. recession could have rolled itself into a slump of such dimensions as to make the political climate favourable to a revision of the gold price. Short of it becoming apparent that this will happen, the case of the marginal mines cannot safely be left in suspense much longer.

Unofficially, the joint committee is understood to have recommended concessions in rail transport rates for marginal mines as well as provision for a more rapid scaling down of the labour force and relief from the necessity of carrying learners on the pay-roll. It is not known whether the committee has also advocated the assumption by the government of terminal silicosis liability although this would obviously be of considerable assistance.

In the absence of a rise in the gold price, we are obviously getting to a point where some of these mines might well be worth more dead than alive, not merely to the shareholder awaiting his break-up realization, but equally to a country in which the rate of industrialization is in the long run likely to be limited more by the size and skill of its labour force than by any other factor. The closing down of these mines would naturally pose local problems of redeployment but these are part and parcel of the problems of government and inseparable from economic progress.

Looking further ahead the government's future tax policy for the gold industry must surely be influenced by the position which will obtain when the new mines have amortized their initial capital expenditures and begin to pay large sums in tax. In some cases (more especially if there is an increase in the gold price) this stage may be deferred further than present calculations might indicate as a result of decisions to expand mill capacity further or to accelerate the rate of mining. Sooner or later, however, taxes will begin to pour in. What then will the government do with its large new inflow of revenue?

There are three main directions in which tax relief could be granted to the industry any time that the government concluded that the gold producers were carrying a disproportionate tax burden. Obviously, the government's first thought will be for the marginal mines but the cost of keeping these alive would be unlikely to absorb more than a small portion of this new prospective revenue.

Of more general interest to the industry as a whole is that both in respect of its gold and uranium production it has for many years been taxed quite disproportionately to the rate which applies for the remainder of the mining industry, and there is certainly a case for modifying the tax formula, alike for gold and uranium. If this is too big a mental switch to ask from any government in a country which has traditionally lived on the proceeds of its gold industry, there is at all events a separate case to be made out for uranium alone, especially as it does not follow that tax relief on this section of the industry's operations would result in a falling off in tax receipts.

This possibility arises from the fact that output from existing uranium producing mines appears to be considerably in excess of what was originally envisaged when the contracts were first drawn up, and it was stated some little time ago that no further contracts would be awarded. On the other hand, there are maybe as many as ten mines still to come into production over the next ten years or so, several of which, it is safe to assume, will be worthwhile uranium producers, and it might well be to everybody's advantage for some revision of existing contracts to be worked out in exchange for the eventual offer of uranium contracts to some of these prospective new mines.

Obviously, the shareholders of existing producers could scarcely be expected to approve of any revision in their very satisfactory uranium contracts unless their boards could offer them some compensating benefit. This might well take the form of a reduction in tax on uranium profits which the government could well afford to give if it were thereby assured of additional revenue from taxes on uranium profits from mines which would not otherwise have been awarded contracts.

PAKISTAN'S MINERAL POTENTIAL

Mineral resources have played a minor role in the economic development of Pakistan. With the exception of encouraging foreign participation in exploring for petroleum and exploiting the natural-gas field discovered at Sui in West Pakistan in 1955, little has been done during the country's first decade of independence towards developing the minerals of economic importance.

The mining industry's slow beginning is attributed partly to lack of private capital, to difficulties hampering operations, and the possibility of nationalization. Factors handicapping mineral production include lack of modern equipment, or foreign exchange to import it; poor transportation facilities, particularly lack of roads; an unstable labour force and shortage of experienced technical and supervisory personnel, and inadequate geological information on which to base the exploitation of deposits. This last deficiency is being remedied by expansion of the services of the Geological Survey of Pakistan (GSP), which, with ICA assistance, is now systematically mapping and prospecting the most important deposits. These points are brought out in a survey of the mineral industry of Pakistan appearing in *Mineral Trade Notes*, Vol. 45, No. 6, published by the U.S. Bureau of Mines. A salient point is that during the Pakistan fiscal year 1955-1956, the contribution of mining to the national income totalled a mere 0.2 per cent.

In the calendar year 1956 the value of mineral production was about Rs.62,359,000, of which Rs.34,953,000 came from crude petroleum and Rs.6,359,000 from natural gas. Exports of chromite and salt in the same year earned Rs.6,946,000, only 0.29 per cent of the total exports of Rs.1.62 billions. However, Pakistan spent about Rs.222,800,000 on petroleum products and Rs.68,679,000 on coal in foreign exchange, about 17.3 per cent of total imports of Rs.1.7 billions.

On the basis of known deposits and probable reserves found by surveys, the Government of Pakistan recognizes that the country's mineral resources could be exploited to a far greater extent. Under the five-year plan, the estimated cost of developing fuels and mineral supplies is given as Rs.457,000,000 of which private industry, principally petroleum, is expected to contribute Rs.365,000,000 and public funds Rs.92,000,000.

The first recommended government expenditure to aid development was for the formation of a Bureau of Mines to control all related departments, in place of a multiplicity of agencies not in a position to foster the industry as a whole. Plans to bring all these departments under a central Bureau of Mines were being drawn up under the guidance of a mining engineer from the U.S. Bureau. However, the plan was dropped in 1956 when the new Constitution transferred certain powers to the provincial governments.

Under the new division of responsibility, the Central Government retains control over petroleum, natural gas, iron ore (excluding red and yellow oxides), manganese, tungsten, vanadium, and all minerals required for the production of nuclear energy; all other minerals passed to the control of the provincial governments. The Geological Survey of Pakistan and the Department of Mineral Con-

cessions, now designated as the Department of Petroleum and Minerals, remain under the Central Government's Ministry of Industry. This Ministry also controls the recently established Atomic Energy Commission, which, under bilateral agreement with the United States, will receive $350,000 towards the cost of a reactor and, with ICA assistance, will construct an interim laboratory for training and experimental work. The offices of the Chief Inspector of Mines and the Salt Administration have passed to the provinces, and regional coal controllers function in Lahore and Dacca, in addition to the Coal Commissioner under the Centre's Department of Supply and Development.

In East Pakistan, where comparatively few minerals of economic importance have been found, it has been relatively simple for the Government of East Pakistan to assume administration. Minerals are under the Directorate of Industries of the Government of East Pakistan. In West Pakistan, the government has been working on the organization of a mining administration since November, 1956. According to recent reports, a separate Mining Directorate may be set up independent of the present Directorate of Industries and Mines, and a Bill to establish a West Pakistan Mineral Development Corporation is pending legislative action.

At the time of partition, it was decreed that all minerals should be state owned, and the Regulation of Mines and Oil-Fields and Mineral Development (Federal Control) Act, 1948, empowered the Central Government to formulate rules covering applications for exploration or prospecting licences and mining leases; determination of royalties; rents, taxes and prices; production, refinement, storage and distribution of minerals; and incidental matters.

Of interest to potential foreign investors are the stipulations that the government has the right to require the licensee or lessee to meet the internal requirements of Pakistan before exporting mineral production, associate Pakistan capital to the extent of 51 per cent (although this may be reduced to 25 per cent as in the case of the petroleum companies if sufficient local capital is not forthcoming), and employ Pakistan nationals in all grades and branches of the organization and arrange for their training to fill appointments on a progressive scale. The government welcomes foreign investment on these terms if no special privileges are claimed and monopolies are avoided. Provision is made for repatriation of capital to the extent of the original investment, and any part of plowed-back profits and appreciation of capital investment, may be treated as investment subject to repatriation. In the event of nationalization of any foreign undertaking, compensation would be paid and would be freely remittable to country of residence.

The mining industry is governed by the general taxation laws of the country and has not as yet been granted any special tax concessions. None of the mineral industries is afforded any special protection through import and export regulations, and the mine operators have been given no priorities to obtain licences to import equipment for expansion. The government of West Pakistan is reported to be strongly in favour of bringing foreign investment to the mineral-development field.

Much mining equipment and many supplies, other than hand-tools, pipe, cable, rail accessories and air compressors and pumps must be imported. The difficulties and delays experienced by mine operators in getting import licences, due to the country's lack of foreign exchange, have severely handicapped the modernization essential to increased output. Several private mine owners were slated to receive equipment for pay in rupees, under the ICA Special-Machinery Aid Programme. Although that aid has been diverted to other commodities, it is understood the mine owners will receive foreign exchange from the government.

The difficulty of obtaining information and advice has discouraged exploration and exploitation of new mineral fields by private entrepreneurs. Maps have been inadequate and for some time were held confidential. An important contribution to improving the situation was made under the Colombo Plan by the Photographic Survey Corp., Ltd. of Canada, which undertook an aerial photo-geologic survey of West Pakistan. Definite information on the extent and workability of probable reserves has been nonexistent, as the small but competent Geological Survey of Pakistan has not been staffed or equipped to undertake conclusive surveys.

The Government of Pakistan has allocated Rs.5,600,000 for the expansion of the Geological Survey of Pakistan under the five-year plan. ICA has also initiated a Geological Survey Advisory Service Project to train Pakistani geologists. It is expected that the number of geologists will double by 1960. During the five-year period, the primary objective of the GSP will be the detailed geologic examination of known resources and systematic geologic mapping of areas favourable to the discovery of additional resources of minerals and mineral fuels. Second in importance, the GSP will give guidance to water supply and civil-engineering projects connected with the agricultural economy of the country, many of which are receiving United States and other foreign aid. It will also fill the long-felt need of publishing information on mineral resources and possibilities of their development—and thereby stimulate the interest of private investors.

EXPANSION IN SOUTH AUSTRALIAN STEEL

The Broken Hill Proprietary Co. proposes to spend £A30,000,000 on the construction of a steel plant at Whyalla. The company already has a blast furnace operating at this centre, important shipbuilding yards, and has built a fine town and harbour where once the only activity was the shipment of iron ore for flux to the Port Pirie lead smelters and ore to the iron blast furnaces in New South Wales. The shipbuilding and pig iron industries have been in operation for some 25 years.

In very recent years the South Australian Government has pressed for the establishment of a steel industry by The Broken Hill Proprietary Co., or else the founding of a State industry. With the latter objective in view, the Mines Department has carried out extensive drilling in the Middleback Ranges, in which are situated The Broken Hill Proprietary Co.'s Iron Knob, Iron Monarch and Iron Baron mines. The drilling is stated to have indicated 30,000,000 tons of iron ore, outside the company's leases. Recent State action was framed to prevent acquisition of private leases for iron ore, but it is believed that the agreement between the State and the company will now confer the right to take out fresh leases in an area 42 miles long by 6 miles wide, in the vicinity of the company's present leases.

The expanson of the big enterprise will call for the supply of more water from the Murray River, railway connection between Whyalla and Port Augusta, and the supply of electric power from the coal-burning power plant at Port Augusta. With the steady depletion of the high-grade iron deposits in the Middleback Ranges, the company is giving attention to the very large occurrences of taconite on its leases, containing about 30 per cent iron. A pilot plant, costing £A100,000, will commence work on this material within a few weeks at Whyalla. If operations are successful, a large plant will ultimately be built near Iron Monarch. The amount of this material available is stated as 100,000,000 tons.

New Developments in Gold Reduction

In a paper recently submitted to "Journal of the South African Institute of Mining and Metallurgy", Vol. 58, No. 7, A. H. Mokken, reduction manager, Van Dyk Consolidated Mines Ltd., shows the advantages, both monetary and operational, that result from a closer study of the effective utilization of African labour. Various recent labour-saving devices and processes are described. In its entirety, the paper, "New Developments in the Operation of a Gold Reduction Works", here presented in condensed form, indicates that whether an ore is simple or refractory, its beneficiation depends upon efficient practice and management.

IN the gold reduction operation as currently practised at Van Dyk Consolidated Mines Ltd., certain more recent developments may be regarded as the most important in their contribution to economies in both European and African labour.

These developments may be listed as : automatic control of rotary filter feed, improved pumping facilities for residue pulp, automatic opening and closing of reverberatory furnace doors, inhibited acid for the removal of lime scale, the canvas leaf clarifier, alterations to the mill water supply system to allow extended use of go-drive descaling, mechanical removal of wood chips from mill pulp followed by automatic sampling, tube mill turning gear for use during re-lining, replacement of the crusher plant thickener by a 12 in. cyclone, automatic elimination of wood chips from the crusher classifier overflow pulp, acquisition of an electric hoist and a large impact wrench for the handling and repair of Symons' crusher parts, annealing of Symons' crusher bowls, and feeding of unslaked lime.

The more important of these factors are discussed in the following columns.

Rotary Filter Brush

The electrically-driven rotary filter brush reached its final form in 1950, and the effects of its introduction were threefold :

(a) It improved brushing of filters which until then had been carried out by a gang of twelve natives whose efforts became progressively weaker as the last filter was reached;
(b) It reduced the time spent on the brushing and patching of filter cloths by half an hour or more;
(c) It eliminated at least one job that required for its completion in reasonable time a relatively large labour force for which, however, no full employment could always be found during the remainder of the day.

Automatic Control of Rotary Filter Feed

A constant pulp level, at the desired elevation, is conducive to steady running conditions as far as tonnage and filter wash are concerned. A varying pulp level not only affects these conditions adversely, especially at extremes, but carries the added disadvantage that labour again, and power, are required to wash and pump away spillage that has overflowed the filter pans.

It is the opinion of the author that the best controllers developed were the types embodying a compressed air-operated Saunders' valve controlled by a float connected by linkage to a three-way cock. Although effective, these devices required attention in the form of lubrication and maintenance, and any slackness in this regard resulted in leakage of air and ineffective operation, inevitably leading back to manual control.

Continued investigation and experimentation, however, has led to the present system at Van Dyk which, in addition to being cheap to install and maintain, can be claimed to be near 100 per cent effective. As before, compressed air is used to operate a Saunders' valve. The air is fed from the mains through a small orifice and is controlled by a cistern ball valve, the plastic ball of which rests on the pulp in the pan. The compressed air costs of this new system are about 100 pence per filter per month. Replacement cost of the ball valve is 10s. A small price to pay for the far-reaching benefits that have been the result of its introduction.

Other Factors

As a result of the introduction of inhibited acid, i.e. acid plus inhibitors to prevent attack on steel, certain economies in the use of labour have been achieved. At Merrill pits acid treatment of Merrill pit bags is carried out *in situ*. As a result, the labour formerly associated with their removal from the pits and transport to and from the acid vat in the smelt house has been eliminated.

The substitution of canvas leaf clarification for sand clarification has lowered the labour demand of this operation in one particular installation from about 400 to 90 native-hours per month.

By suitable alterations to the mill water supply system, water power has substantially replaced manual cleaning of mill water pipes.

Dilution Control

To control dilution to tube mills and classifiers, operators were guided by samples taken for pulp density measurements. Any adjustment needed was effected by a small change in the dilution valve settings but, although the valves were calibrated, the actual quantity flowing still remained a function of the prevailing pressure in the system, the extent of scale formation at the time and, perhaps, the size and shape of an obstructing foreign body.

In the absence, therefore, of a constant measure of water feed or pulp density, it was inevitable that water solid ratios of the tube mill and classifier pulps would fluctuate in larger or smaller degree between unknown limits, and it was appreciated that, unless some measure of control could be applied, these surges would remain a constant obstacle to efficient operation.

Indicators were developed for tube mill and primary classifier dilution control. These units are calibrated in gallons per minute and are very sensitive to fluctuations. A change in the rate of flow, resulting from a variation in pressure in the system or for any other reason, is immediately indicated. When a mill is started after having been stopped, the water feed can, if so required, be returned to its exact former flow. The difference in water consumption between similar installations is indicated.

Filtration and Dissolved Gold Loss

The problem of reducing the dissolved gold loss from the rotary filters at Van Dyk has been the subject of careful study for many years. The improvements gained reflect

the success of what could be described as an operational research programme, initiated when the first sample of residue filtrate was sent for assay nearly twenty years ago.

This was followed by a series of modifications in design and operation which together have reduced the net dissolved gold loss—excluding barren values—from approximately 0.04 dwt. per ton of solids filtered to the present figure of 0.01 dwt. per ton.

Important Modifications

Important modifications that have contributed to this reduction are, in chronological order : A change from horizontal filter grids to the diagonal type. This change reduced the volume of filtrate lock-up formerly held in the channels under the grids, part of which was lost during blow-off. Again, the installation of a thick scraper in order to allow residue cake to build up on the top edge of the scraper and thus form a barrier against which blow-off solution would be deflected back into the filter pan.

Other important modifications included the development and installation of a movable scraper, aimed at preventing loss of partly washed cake when a filter was stopped. In the event of a trip-out of the residue conveyor this scraper, when drawn back, has the added advantage of preventing further deliveries of residue cake from overloading the belt. There followed the introduction of the mechanical brush which improved brushing of filter cloths. This was followed in the same year by acid treatment with inhibited acid. The design and installation of an automatic sampler for residue pulp appeared next on the chronological table.

In sequence came the re-positioning of spray water valves and the provision of platforms to enable operators to control more effectively the distribution of wash over the filter drums. In addition, a separate pump was reserved to pump barren solution to the filter sprays. Later an electrode was placed in the wet vacuum receiver in such a way that a rise in solution level in the drum above a predetermined safe level would touch the electrode and close an electric circuit to the alarm. The object of this installation was to prevent the solution level from rising above the top of the incoming filtrate line and so closing off the air passage.

The use of asbestos-cement pipes as spray pipes followed and the ball valve pulp level controller was the latest installation.

Critical Considerations

In view of the weak acid solutions used, the question naturally arises whether an inhibitor is, in fact, necessary during acid treatment. Future developments will question its economy in comparison with acid-resisting materials for the manufacture of equipment subjected to acid treatment.

The answers to these questions, naturally, can only be found from a thorough investigation. Suffice it to say that, up to the present, in the plant under review, the cost of inhibited acid has amply been covered by a saving in renewals expenditure, labour and by improved operating efficiencies. Its introduction has permitted extensions in the application of dilute hydrochloric acid for the control of lime scale.

Low Grade Ores in North American Steel Production

AS with other metals, the iron ore trade in North America during 1957 was characterized by market uncertainty which was a direct reflection of conditions in the U.S. steel industry, but the outlook remains materially unchanged. Periodic readjustments have been characteristic of North America's iron and steel operations for decades, as Mr. M. S. Fotheringham, president of Steep Rock Mines Ltd., has pointed out. The present one is not considered by industry leaders as either abnormal or disturbing. The long-range outlook for substantial increases in iron ore consumption remains unchanged.

Mr. Fotheringham maintains that iron ore sales at the expanding rate which economic studies forecast, offer the best single means of reducing Canada's trade deficit with the United States and of providing new funds to finance Canadian purchases there. Canada has already moved from a position of no consequence in iron ore production in 1937 to fourth among world producers in 1957. Iron ore is now close to top leadership in the country's list of minerals. The most recent estimate is that Canadian ore output can reach the half billion range in annual dollar value around the middle of the present half century.

Canada's Principal Markets

The principal market for Canadian ore is the U.S., but the Gordon Commission has already warned that, should obstacles be placed in the way of exports, U.S. requirements could probably be filled elsewhere.

Steel makers who are zealously selective and traditionally take a long-term view, prefer to know their raw material sources 25 years in advance. For the Canadian ore industry, this not only calls for continuing research and greater attention to product development and marketing methods, but it also means that expansion of future production and assurance of increasing quality of product must be planned in detail now.

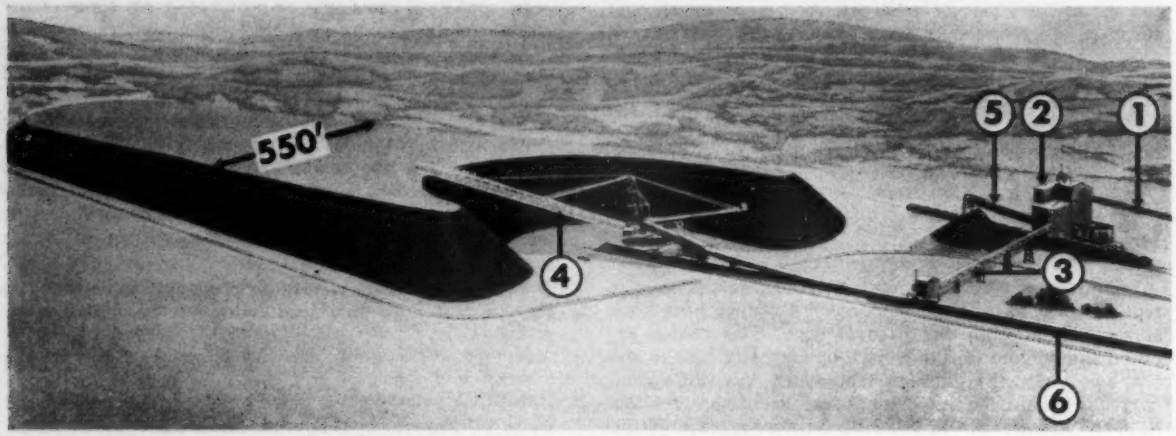
Product development programmes have been initiated to ensure that Steep Rock ore continues to be soundly competitive in the U.S. market.

The Steep Rock expansion and product development programmes are on schedule and will so continue during 1958.

Of growing importance to the iron and steel industry of North America are the use of low-grade ores and the development of commercially feasible processes for the

UNITED STATES IMPORTS OF IRON ORE, 1956 AND 1957
(000 Gross Tons)

Country of Origin	*1956*	*1957 Eight Months*
Canada	13,720	8,097
Venezuela	9,246	7,716
Peru	1,814	1,575
Chile	1,538	1,528
Liberia	1,218	672
Brazil	1,214	945
Sweden	1,002	483
All Other	606	441
Peak Total	30,358	21,457



The Hoyt Lakes stockpiling system used during the winter. During the Great Lakes navigation season, finished pellets from the plant are loaded at the car pocket while stored pellets are reclaimed from pile to cars with shovels. Shown are (1) plant conveyor, (2) car loading pocket, (3) cross conveyor, (4), belt conveyor stacker of 275-ft. radius, (5) emergency conveyor, (6) trailing conveyor

direct reduction of ores. Progress in both these fields is surveyed in a report prepared by the Business and Defence Services Administration of the U.S. Department of Commerce. A paper describing the handling of taconite pellets by the Lake Erie Mining Co. at Hoyt Lakes, Minnesota, was summarized in a recent issue (*The Mining Journal*, August 23, 1957, pp. 220 and 221).

The report points out that problems arising from depletion of the high-grade reserves of the Lake Superior region are being resolved by greater use of low-grade ores and increased supplies of high-grade ores from abroad, particularly the Western Hemisphere. The latter development will, of course, be furthered when the St. Lawrence Seaway is in full operation within the near future.

Use of Low-Grade Ores

The use of low-grade ores has come about through increased use of various beneficiation processes, of which one of the most significant has been the processing of taconite. Taconite has been the subject of research and experimentation for over 20 years, but the processing of this material has only recently reached a commercially feasible stage.

New facilities, with first production scheduled for late 1957 and the completion about a year later, will add significantly to the industry's capacity to provide a usable metallics charge in the form of pellets of 64 per cent iron content. This facility, plus others already in operation and planned for the next few years, will bring total pelletizing capacity of about 13,000,000 gross tons from 40,000,000 tons of crude taconite and also jasper, another low-grade ore.

In the meantime, other beneficiating facilities, such as ore sintering plants, are also being installed to increase the total ability of the industry to use other low-grade ores. Since the use of sintered ore increases blast furnace capacity by as much as one-fifth and decreases the coking rate, the industry is undertaking a large-scale expansion of sintering capacity.

Imports of iron ore, which have been increasing steadily over the past few years, are expected to reach a new peak of about 32,000,000 gross tons in 1957, 7 per cent above the 1956 figure. The table appearing on the previous page shows 1956 and 1957 imports by country of origin.

H-Iron and R-N Processes

The long-standing search for commercially feasible processes for the direct reduction of iron ore to provide a melting stock usable in steel-making furnaces without the necessity of going through a blast furnace operation, received increased attention during 1957. The most widely publicized process in this field is the H-iron process, in which hydrogen is the reducing agent. Since only oxygen is removed in the reduction process, high-grade ores must be used in the H-iron process so as to limit the extent of impurities in the iron product charged into the steel-making furnaces. A number of U.S. and imported ores lend themselves especially well to this process. A semi-commercial plant has been in operation for about three years.

Development of another process, the R-N process, reached the point in August where licence agreements were offered to the industry by the controlling companies. In this process, the fuel used is solid carbons, while the type of ore used may be either low-grade or high-grade. When low-grade ores are used the result is an upgraded product, part of which may be used directly in steel-making furnaces, thus reducing dependence on high-grade ores for such purposes, a good portion of which is imported. The balance of such upgraded product is charged into blast furnaces. The product of high-grade ores in the reduction process is entirely suitable for steel-making furnaces. A semi-commercial plant has been in operation for two years.

In the case of both the H-iron and R-N processes, it has been estimated that the cost of constructing a reduction plant is about half the cost of a blast furnace (with coke ovens) to produce equivalent amounts of iron. An important factor in production costs is the relative cheapness of the material from which the reduction agent is derived; namely, natural gas, petroleum, and low-grade coals.

Other processes have reached various stages of development. Despite the promise of all of them, their use on a limited commercial scale will not, of course, replace the blast furnace within the foreseeable future. They will, nevertheless, permit a wider use of low-grade ores and low-grade fuels, particularly in areas lacking coking coal and having cheap natural gas; and, by providing a type of "synthetic" scrap, reduce dependence upon limited supplies of high-grade obsolete scrap.

MULTI-ROPE WINDING—III

Safety Factors in Testing the Multi-rope Winding System

A paper by R. Blair, M.I.Mech.E., M.S.A.I.Mech.E., in "Journal of the Institution of Certificated Engineers", Vol. 30, No. 6, South Africa, described a new type of drum winder, designed to meet the requirements of deep-level mining with increased loading. The following article, concluding a series of three, is condensed from this paper.

HEADFRAME sheaves of 6 ft. dia. were utilized for these tests (representing only 82 rope diameters), and the angle of rope between engine room and headframe 35 deg., resulting in a load on each headframe sheave of 22,000 lb., or a pressure of 450 p.s.i. on the rim. When one rope was severed, the resulting pressure on the single sheave was approximately 730 p.s.i.

Proven Safety of System

With this low factor of safety and capacity factor, the safety of the whole system has been thoroughly proved. The author is, therefore, of the opinion that it is reasonable to assume that an approach to the Department of Mines for a lower capacity factor and factor of safety when commissioning the multi-rope drum winder might be favourably considered.

From the comparisons made it is quite obvious that by utilizing multi-rope drum winding with reduced factors, the end load can be increased by 5 *tons* for the same rope weight.

Due to utilizing smaller diameter ropes, drum diameters can be reduced and the winder operated at increased revolutions per minute for the same rope speed.

An example compares multi-rope drum winders with the Koepe system for equivalent pay load from 6,000 ft. Although the total weight of rope installed with the multi-rope drum winder is 48.4 tons, 24.2 tons only is suspended in the shaft at any one time, whereas with the Koepe system the full tonnage (111.6) is constantly hanging.

Use of Balance Ropes

Naturally, the h.p. required for the drum winder, when operating without balance ropes, is in excess of that required for the Koepe system, but there are many installations where the advantages made available by the added flexibility of operation produce the result of outweighing the saving in cost.

Although the R.M.S. rating of motors is very much in excess of that required with the Koepe system, the difference in overall consumption of electrical energy per ton hoisted is negligible and would amount to that brought about by the additional electrical and mechanical losses due to the greater h.p. For the above comparison, with a 19 ton pay-load and a hoisting speed of 3,000 f.p.m., the additional consumption would amount to approximately 18 kWh. per trip with the a.c. winder (which is less than one kWh. per ton hoisted) but with the Ward-Leonard installation the units consumed would be the same as with the Koepe system.

Reduction of Horsepower

Should it be decided that reduced h.p. is advantageous, this can be accomplished by installing balance ropes for point-to-point winding, while retaining to a minor degree the advantages derived from clutching. This would obviate loss of time neeessary for adjusting capel ends when compensating for rope stretch if operating the Koepe system. As there is a distinct difference in rope lengths when lowering and raising the shift, this difference can be adjusted by clutching.

There is a further advantage with the drum winder in that it can be balanced to any desired extent whereas the Koepe is limited and is essentially a fully balanced system.

The travel of balance ropes in the shaft presents no greater problem than with the Koepe system, although the loop has to rise and fall according to the number of layers on the winding drum.

Full Benefit From Balance Ropes

With the introduction of a new method and utilizing multi-rope drums winding with shaft layout designed accordingly, full benefit can be derived from the installation of balance ropes and at the same time it is suitable for multi-level operations. Full clutching facilities can be made available between surface and any point in the shaft and, if so desired, both conveyances could be clutched to surface thereby providing added facilities for skip repairs and replacement of balance ropes.

It is, therefore, possible with the multi-rope drum winder to have reduced power in addition to full flexibility of operation.

DETAILS OF ROPES USED DURING TESTS

Specification of Ropes Used

Supplied by Rand Ropes Ltd.; ⅞ in. dia.; Langs Lay; fibre core, 6/6/1 construction; dia. of outer wire, 0.096 in.; centre wire, 0.102 in.; class of core, steel wire; best patent basic; tensile, 90-100 tons; weight per ft., 1.228 lb.; breaking load, 27 tons.

Loading and Factor of Safety

Weight of 4,000 ft. rope = 4.912 lb., therefore twin rope ... ... =	9,824 lb.	
Weight of conveyance and contents ... =	16,000 lb.	
Therefore total suspended weight ... ... =	25,824 lb.	
Breaking load of rope, 27 tons ... ... =		54,000 lb.
Therefore twin rope =		108,000 lb.
Therefore factor of safety at 4,000 ft. ... =		4.182
And capacity factor =		6.75
Therefore factor of safety with broken rope at 3,500 ft. ... ... =		2.66

Machinery and Equipment

High Tower Colliery Lighting

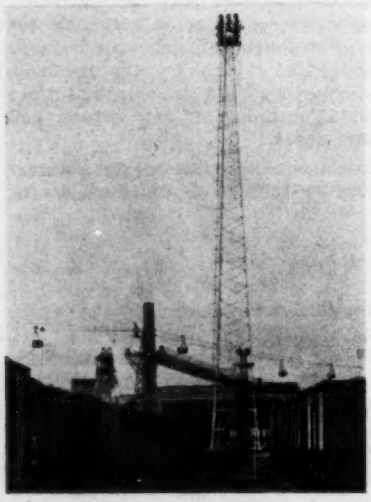
Railway marshalling yard lighting, using standard M 25 long-range tungsten floodlight projectors on high towers, has recently been installed at Blidworth Colliery, in No. 3 Area, N.C.B., Midlands Division. Of all bodies in the country, the N.C.B. probably have the greatest potential interest in the question of lighting large marshalling yards. The high tower lighting at Blidworth is regarded as a pilot scheme for the area.

The rail layout at Blidworth, as in most collieries, is particularly suited to this type of installation, consisting essentially of three straight railway grids, sited end to end. Empty trucks are assembled on the first grid, which converges to a single track at a weighbridge. The trucks pass through this neck to the central grid, where overhead conveyors load them, and then pass via a second weighbridge to the third grid to await transportation. Each of these grids is 200 ft. wide and from 300 to 400 yds. long.

Towers 150 ft. and 100 ft. high, carrying M 25 projectors housing Mazda 1,500 w. G.L.S. lamps, are situated at each of the siding necks, and floodlights from opposite faces light the three sections, the lighting of the centre section, where loading takes place, being shared by both towers, thus ensuring maximum utilization of the towers. The towers are ideally situated, one on the centre line of each of the outside grids, as in this position the minimum amount of shadow is cast between the trucks and they are under close observation by the weigh-office staff.

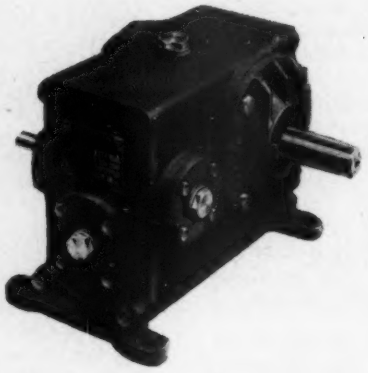
The considerable flexibility resulting from the ability to add to or redirect the floodlights as required favours the system, and it has been found practicable to dispense with much of the surface lighting in other parts of the colliery by the use of a few additional floodlights, suitably trained. It would appear that the system would lose some of its advantages if applied to sidings which are curved, but experiments are being carried out which are expected to confirm that even at reduced efficiency it will still be far superior to the systems more usually employed before.

The scheme was designed by A.E.I. Lamp and Lighting Co. Ltd. Towers were supplied by Tubewrights Ltd. The contractors who designed foundations, erected towers, and carried out electrical installations were Clough Smith and Co. Ltd., Wolverhampton.



A DOUBLE REDUCTION UNIT

The latest addition to the range of David Brown worm-gear units, which are made in various types and sizes, from 1¼ in. to 28 in. centres, is the new size 2¼ Radicon double reduction worm reducer. Designed for low-powered, slow-moving drives, this unit provides a choice of fifty-three ratios between 65 to 1 and 3,600 to 1, with a correspondingly wide range of output torques, between 1,270 and 3,300 lb. per sq. in. at input speeds from 500 to 3,000 r.p.m.



The standard ratios of the 1¼ and 2¼ single reduction units are combined to give this extensive range of ratios, and a further feature is the use of the single reduction unit gears, with the exception of the second reduction worm-shaft.

Detachable feet are fitted and alternative facings provided so that the unit can be mounted in a number of different operating positions.

AN ELECTRO-MAGNETIC EXTRACTOR

Rapid Magnetic Machines Ltd. announce an interesting addition to their already wide range of magnetic equipment. The B.S.X. type Electro-Magnetic Extractor has been specially developed for extracting finely abraded iron present in P.V.C. or other plastics. The equipment can, of course, also be used for the removal of fine iron particles from any other material in granular or powder form.

In the operating technique, the material is fed into a hopper which incorporates an adjustable feed gate and flows down a chute. Above this chute is suspended a stationary suspension magnet of super-high intensity, fitted with two pole pieces suitably positioned across the feed to provide a field of deep penetration. The extractor is enclosed in a sheet-steel housing. The iron contamination is attracted and held by the magnet pole shoes whilst the cleaned product passes forward to the next process. Suitable vibrators can be fitted to both the feed hopper and the feed chute in cases where material is not free flowing.

The Rapid B.S.X. Extractor is produced in several widths and a capacity of approximately 600 lb. per hour is possible on a 3 in. wide model when handling P.V.C. granules. When correctly applied, efficiencies approaching 100 per cent are claimed to be quite feasible.

STREAMLINED SAFETY GOGGLES

A further advance in Panorama eye protection is the streamlined version of the Panoramette P.V.C. safety goggle.

Giving complete protection from all sides, the new Mark III has no grooves or cut-out sections in the windows. The lip of the frame has been deepened all round, the result being that the window which fits in at the point of the frame on the top of the nose, slips into the groove easily and is held in a firm grip by the deepened lip of the frame. It is impossible for the window to slip out, even when the goggle is used under extreme heat conditions, which can cause the P.V.C. frames to demould or distort.

An added advantage of this streamlining is that the worker who is actually using the goggle can quickly replace the lenses without having to find any fitting point. The side slots have been strengthened and widened to take ¼ in. elastic. The new Panoramette Mark III has been tested and passed B.S.S. 2092:1954 for light and heavy duty wear.

Above: The effect of the Blidworth Colliery lighting system at night

Centre: The David Brown new double-reduction unit

Below: Long-range tungsten floodlight projectors on light towers at Blidworth Colliery

Technical Briefs

Heavy Media and the Driessen Cone

In Bulletin of the Institution of Mining and Metallurgy, Vol. 67, No. 616, a summary and conclusions drawn from consideration of apparent viscosities of heavy media and the Driessen Cone points out that the apparent viscosity of a heavy medium, as determined by a Fann rotational viscometer, has been related to rates of shear in an attempt to make an analysis of the apparent viscosity of the heavy medium in the actual operation of the Driessen Cone. The rates of shear in the cone have been derived from the tangential velocities of medium at various distances from the centre of the cone.

The velocities have been calculated from measurements of rotational speeds at these various radii by means of an anemometer and stroboscope. The equation for the velocity curve in a 6 in. cone was found to be:

$$v = \frac{K}{r\,0.268}$$

Conducive with best operating conditions of all other cone variables, mineral separation efficiency is enhanced when the apparent viscosity of medium in the cone is kept as low as possible. The following cone operating conditions tend to lower the apparent viscosity of a feed medium of constant specific gravity: Cone inlet area equal to overflow orifice area; high ore-to-medium ratio; coarse media; high specific gravity of media particles; media particles with high sphericity; high inlet pressure, and small diameter cone.

Cone inlet area has no effect on the rate of shear in the cone, and therefore does not produce any change in the apparent viscosity of medium. An increase in cone inlet pressure increases the rate of shear and therefore lowers the apparent viscosity of medium. Different diameter sizes of cones will produce comparable concentration metallurgy if the specific gravity of medium, the apparent average viscosity of medium, and the cone ratio are the same.

SEPARATION OF FINE SOLIDS

A modification of the flotation termed "floc" flotation has been described (*La Flottation Classique et la flottation des flocs*) by E. Frenay of the University of Liège in the February number of *Genie Chemique* (Vol. 79, No. 2). This method for the separation of very fine solids involves enclosing a gas (usually air) inside the flocs so that they can be separated by sedimentation and flotation. Results are said to be striking. It is interesting to recall that the late E. A. Knapp carried out a great deal of work on the separation of "flocs" as a means of mineral separation shortly after the war and achieved a certain amount of success, although nothing was published.

The Brussels Universal & International Exhibition, 1958

Between 35,000,000 and 50,000,000 people are expected to visit the Universal and International Exhibition held at Brussels from April 17 to October 19, 1958. This is the first world exhibition to be held in Europe since the Second World War, and according to international agreement, no other of its type can be held in any European country before 1964.

The United Kingdom is represented at the Exhibition by the British Government Pavilion, organized by the Central Office of Information on behalf of the Foreign Office, and by the British Industries Pavilion, organized by the Federation of British Industries through its subsidiary, British Overseas Fairs Ltd.

The Shop Window

The Government is spending £400,000 on its pavilion and supporting features. The cost of the British Industries Pavilion and accompanying features will exceed this sum. The contributions made by other exhibitors reveal that total British expenditure is estimated at between £2,000,000 and £3,000,000.

The British electrical industry, with its allied industries, has consistently maintained its leading position in this country's trade, and last year its exports, valued at nearly £280,000,000, were about twelve times the pre-war figure, representing some 23 per cent of the industry's total production. British exports of electrical goods were nearly a quarter of total world exports in this field.

At home, the industry is having to meet ever-increasing demands for the vast developments in conventional power plant, atomic power plant, the electrification of British Railways, and coal and steel production, as well as the increasing use of electricity in the home and in industry at large. Backed by an annual expenditure of well over £30,000,000 on research and development alone, the electrical industry is particularly well equipped to meet the demands of the future.

One of the most important congresses to be held during the Exhibition will be the British Electrical Conference, to be held on May 16 and 17, at which some of Britain's outstanding achievements in the electrical field will be presented to the world. The Board of Trade, in agreement with the U.K. Atomic Energy Authority, has arranged that its major contribution to nuclear energy publicity in the field of exhibitions in 1958 should be the stand at Brussels.

Drills and Diamonds

Of perhaps more direct interest to the mining industry, the Diamond Trading Co. Ltd. is exhibiting a collection of rough diamonds which has an approximate value of £150,000. These diamonds are representative of the productions found in Africa, and carry the nomenclature by which the qualities are known to the world diamond trade. The large, rough stones shown are outstanding examples of the qualities they represent. The group of diamonds which carries the caption "Mixed Production of Antwerp Qualities" is typical of the type of rough diamond in which the skilled diamond cutters of the Belgian diamond industry have specialized for many years.

It is of interest to note that in order to recover one carat (0.2 grammes) of diamond, it is necessary to extract and crush 250 tons of blue ground. (Two examples of blue ground are shown in the display window under the caption "Diamond in Matrix".) Only a cupful of diamonds would be recovered from the contents of 2,500 railway trucks filled with ores from the mines.

Atlas Copco are exhibiting in the Metal Industries Pavilion, where they are showing an extensive selection of their compressed air equipment which includes large wagon drills for mining and quarrying as well as other equipments. Also being shown are an extensive range of portable compressors, from the VT4, one of the most modern of portable compressors, having a free air delivery of 150 c.f.m. up to the 500 DodB with a free air delivery of 510 c.f.m.

Best known of all Atlas products are their rock drills and on the stand is shown the BVB21 wagon drill, the BBD12WH, the BBC22WK and BBD46WR.

The BVB21 wagon drill is a medium heavy-duty unity accommodating 10 ft. steel changes and capable of sinking 150 ft. holes. It is extensively used in open cut mines, quarries, and on various types of construction jobs. Holes can be drilled at any angle within a 130 deg. arc and when set up the rig can be swivelled horizontally for accurate lateral positioning. The rock drill, which should be either an Atlas Copco BBC42RB or BBC43RBL, is mounted in a cradle sliding along a channel guide and fed by an adjustable chain running over two sprockets provided with ball bearings.

The BBD12WH, named the Terrier, has been designed for small drilling operations; for example, kench drilling, rippings or secondary blasting, where drill speeds are not of prime importance and light weight and economy of compressed air are the main considerations.

The BBD12WH, which is a water flushing machine, is equipped with a new type of drill steel holder with rubber buffer; the rotation chuck is completely covered by the lower head. The BBC22WK, named the Lion, has recently been introduced with the new pusher leg type BMT50. The Lion is designed for working in large tunnels or mines where holes from 10 to 90 ft. are to be drilled.

Other Exhibitors

A Rolls-Royce diesel represents the Rolls-Royce "C" range of diesel engines which are operating in earth moving, trucking, marine, oilfield equipment, and rail transport installations in more than seventy countries all over the world.

The British Timken Ltd. display consists of a wide range of products, from a four-row rolling mill tapered roller bearing, weighing 3½ tons, down to miniature bearings. Around the perimeter of the stand are illuminated colour transparencies showing various departments and machines of British Timken Ltd., as well as photographs of many other applications of Timken bearings, such as machine tools and rolling mills.

Other exhibitors of interest to the mining industry are Imperial Chemical Industries Ltd., Imperial Chemical Industries Ltd. (Metal Division), Holman Bros. Ltd., and Rapid Magnetic Machines Ltd.

MINING MISCELLANY

Ten tons of lead ore were produced in Nigeria in January.

★

Iron ore deposits estimated at approximately 10,000,000 tons of 30 per cent content are reported as having been discovered in the Kolari area on the border between Finland and Sweden.

★

Austria produced an estimated 1,950,000 tons of pig iron in 1957. Crude steel output is estimated at 2,500,000 tons.

★

During 1957 aluminium ingot production in Austria reached an estimated 75,000 tons, compared with 70,764 tons in 1956.

★

In 1957 Malaya produced 59,293 tons of tin in concentrates, 4.8 per cent less than in 1956.

★

Large quantities of minerals, including nickel and semi-precious stones, are to be developed on Madagascar when sufficient capital has been made available.

★

During 1957 some 43,500,000 tons of coal were produced in India, as against 39,000,000 tons in 1956.

★

Divisional offices of Mines and Geology are to be set up in Mysore State in the near future to undertake a survey of the mineral potential of the State.

★

The Indian Bureau of Mines may instigate exploration for copper ores at Ghani, Andhra Pradesh. The Government may also study further the Panna diamond deposits with a view to assessing their potentials.

★

It is reported that "very large" coal deposits exist in the Nugssuak peninsula in Greenland. The deposits are expected to yield 1,000,000 tons of coal.

★

A total of about 1,765,000 cu. yds. of overburden has been removed from the first mine cut at Neiveli, South Arcot District, Madras, up to December 31, 1957. Conventional mining machinery was used. The pilot briquetting plant has been received at the site and is under construction. The plant was supplied under Technical Co-operation Mission aid.

★

Twelve M.P.s, six from the Conservative and six from the Labour parties, spent three days this week at the headquarters of the High Authority of the European Coal and Steel Community in Luxembourg.

★

The Mathais Stinnes AG coal mining company has stated that the Saturday shift at one of its pits in Muelheim is to be cancelled because of the poor sales position. The pit produces about 4,000 tons of hard coal daily.

★

A steel-wire rope weighing in excess of 26 tons was recently shipped from Liverpool for installation at the St. Arthur mine in Belgium. The rope was manufactured in Warrington by the Whitecross Co. Ltd. The rope is 1,392 yds. long and has an actual breaking load a little in excess of 400 tons.

★

The principal feature of a revision of BS 1259: 1945 is the introduction of a list of flammable gases and vapours in respect of which apparatus may be accepted for test and possible certification. These gases are placed in four classes (methane, pentane, ethylene and hydrogen) for the purposes of tests which are described in an appendix. The standard specifies requirements for all types of electrical equipments regarded as being safe for use in dangerous explosive atmospheres.

★

The first Soviet experimental coal pipeline has been designed by Lvov scientists. It will deliver pulverized coal at a pressure of up to 200 atmospheres from the Lvov-Volyn coalfields to the Dobrotvorskaya power station some 40 miles distant. The line is assembled of steel tubes 300 mm. in dia. Cost of operation is said to be almost three times as cheap as transport by rail. The pipeline will release 25,000 heavy duty railway wagons a year.

★

Coal production in China during 1957 is estimated at more than 122,000,000 tons by the National Economic Commission. Work is to begin this year on 133 new pits, said to be capable of adding 29,000,000 tons annually to the national production. Twelve coalfields surveyed in Honan are estimated to contain 20,000,000,000 tons of coking, steam and household coal.

★

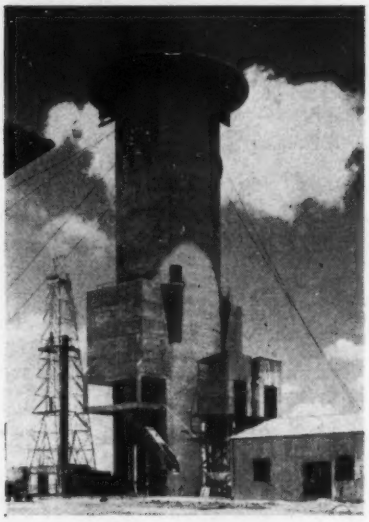
The Geological Bureau of the Chinese State Planning Commission announced on January 3, 1958, that China has the world's richest potential reserves of tungsten, molybdenum, tin and antimony ore. During the past five years workable deposits of natural gas, boron, and mercury have been located. Extensive reserves of mananese, copper, lead, zinc, aluminium, magnesium, sulphur and phosphorous ore are claimed to exist within the country.

★

Compared with 1957, iron output in the Soviet Union is to increase by 400,000 tons this year and steel by 600,000 tons. New blast furnances are to be put into operation, including the biggest in the country at the Chelyabinsk works in the Urals. Construction of the country's third iron and steel centre, the West Siberian Metallurgical Works, is to be commenced in 1958.

★

The Geological-Geographical Section of the Soviet Academy of Sciences has proposed the setting up of a Geological Institute, with branches at the regional headquarters of the Academy. This Institute would propose methods for more economical mining and prospecting, and investigate minerals and ores with a view to their suitability for industrial exploitation. The new Institute would contribute to the co-ordination of ore mining throughout the Soviet Union and help to cut out waste.



The 150 ft. high headframe of the No. 1 Shaft at Riebeeck Gold Mine. This 26 ft. dia. circular shaft will be sunk to a depth of 5,800 ft.

The Krupp-Renn process for economical treatment of low-grade iron ores, invented in Germany, is being introduced in the United States by Southwest Engineering Co. of Los Angeles. The announcement was made at the recent Pacific South-west mining industry conference of the American Institute of Mining, Metallurgical and Petroleum Engineers. The reduction process for production of metallic iron from ore can now be applied to Western ores and coals to produce iron pellets at costs as low as $16 per ton. The pellets are suitable for direct charging to open-hearth or electric steel-making furnaces.

★

A joint working party, composed of representatives of the Commission of the European Atomic Energy Community (Euratom) and the Government of the United States, recently concluded a series of meetings in Luxembourg. This group has been studying the means whereby a joint Euratom - United States nuclear power programme might be developed. The objective would be to initiate promptly a programme aimed at bringing into operation by 1963 a number of large-scale nuclear power plants, to be built within the Community, primarily of the pressurized and boiling-water type, and having a total installed capacity of approximately 1,000,000 kW. of electricity. The group also has been examining the principal aspects of a supporting joint research and development programme which would be centred on these reactors. The programme would be designed to encourage maximum participation by the industries of the Community and of the United States. Substantial progress has been made towards these objectives, and it is planned that there will be further discussion of the proposed joint programme in Washington later in April.

★

The first airborne exploration operation of a new area in West Africa using the airborne magnetometer is now nearing completion in Sierra Leone. Upon completion, 4,000 sq. miles will have

been surveyed. These airborne geophysical studies are being undertaken for the Department of Overseas Geological Surveys on behalf of the Sierra Leone Government. Canadian Aero Service Ltd. is performing the survey. Derby Aviation Ltd. is providing the pilots and aircraft.

★

The Government of India is to set up a sub-committee on mica to advise the government on all matters connected with the mica trade and industry. The decision has been taken on the recommendations of the Mineral Advisory Board. It was decided at the meeting of the Board that the Mica Advisory Committee should not continue as an independent committee, but should become a sub-committee of the Mineral Advisory Board. Traces of mica have been found in Neivacheri village in Karaikal. Samples have been sent to the Pondicherry Government with a suggestion that a geological survey of the area should be undertaken soon.

★

In South Australia, uranium mining is reserved to the State, and this policy has effectively discouraged the prospector, who has had a free hand in other parts of Australia. The South Australian Government has opened up and is working the Radium Hill uranium mine, and has established a chemical treatment plant for uranium ores and concentrates at Port Pirie, where the Radium Hill concentrates are processed. Other discoveries have been made in the Radium Hill belt of country by government parties north of the operating mine, and it has been decided to further prospect these occurrences by diamond drilling. About 4,000 ft. of surface drilling is planned on the new discoveries and 2,000 ft. of underground drilling in the Radium Hill mine itself. This work may add considerably to South Australia's uranium resources, and metallurgically the State is well equipped to deal with increased production.

★

Manufacture of metallurgical coke from brown coal is expected to be a great forward step in Victorian industry. Successful production of coke from this source was announced about twelve months ago, but the doubt was generally expressed that the coke would lack strength and be suitable for foundry purposes only. A recent announcement advises that coke has been specially developed for the smelting of iron and steel, as well as other metals in foundries. This follows several years of research at the Melbourne University. It is claimed that brown coal coke will be cheaper and better than black coal coke, which is imported from New South Wales to the extent of some 110,000 tons per year. A pilot plant is to be erected at a cost of £A90,000, which will produce 25 tons of coke per day. If successful, a large plant will be built to supply the needs of the State of Victoria, and possibly of South Australia and Tasmania also. It is thought that in a few years Victoria will be independent of black coal coke imports from New South Wales.

PERSONAL

Mr. A. W. Stead has been appointed labour attaché to the South African Embassy at The Hague.

★

Mr. T. S. Horan, director of Megator Pumps and Compressors Ltd., leaves for India on Monday, April 21.

Mr. J. D. Tennant, controller of the Borax (Holdings) Group, has been appointed to the board of the company.

★

B.T.R. Industries Ltd. announce with regret the death of Mr. M. Warner, manager of the Mechanical Sales Department.

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The steam group of the Institution of Mechanical Engineers meets on April 22; the education group on April 23; an ordinary meeting takes place on April 25; the automobile division meets on April 29; and the industrial administration and engineering production group on April 30.

★

The 120th annual meeting of the British Association for the Advancement of Science will be held in Glasgow from August 27 to September 3. Sir Alexander Fleck, chairman of I.C.I., is this year's president.

★

The annual dinner of the Camborne School of Mines will be held at Tonkin's Restaurant, Camborne, on May 9, 1958.

COMPANY EVENTS

On April 1, Mine Safety Appliances Co., United States, purchased a controlling interest in the Auergesellschaft Aktiengesellschaft (Auer Compant Inc.). The sale covers the entire manufacturing facilities of Auergesellschaft in West Berlin and Schwabisch Gmund.

★

Mr. E. M. Jacob and Mr. J. Lowenstein inform us that by mutual consent they have ceased to be associated together in E. M. Jacob and Co. Ltd. Mr. E. M. Jacob will be managing director of Jacob Metals Ltd., which company will conduct its domestic and overseas business from offices at Greenwich House, 10-13 Newgate Street, London, E.C.1 (telephone City 8401; cable address, Metaljacob; telex, London 28655-Metaljacob). J. Lowenstein and Co. Ltd. will continue their domestic and overseas business from their present offices at Greenwich House, 10-13 Newgate Street, London, E.C.1 (telephone City 8401; cable address, Lometa).

CONTRACTS AND TENDERS

The International Co-operation Administration announces the following future procurements:

South Africa

One rotary-type portable air compressor. Closing date, April 30, 1958. Ref. ESB 8891. Telephone inquiries to Chancery 4411, extension 771 or 738.

C.A. Federation

Ninety aluminium beacons (or similar light durable alloy). Closing date, April 25, 1958. Ref. ESB 8916. Telephone inquiries to Chancery 4411, extension 738 or 771.

C.A. Federation

Three 1 to 1½ cu. yd. struck capacity tractor shovels for truck loading (specified). Bids to Secretary, Federal Tender Board, P.O. Box 8075, Causeway, S.R. Closing date for bids, May 2, 1958. Ref. ESB/9289/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Pakistan

One hundred and forty-eight tons zinc tiles. Bids to Director-General of Supply and Development, Chittagong. Closing dates for bids, April 24, 1958. Ref. ESB/8908/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

India

Coal conveying system. Sealed tenders. Damodar Valley Corporation Bermo Colliery. Tenders by April 29, 1958. Ref. ESB/8787/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Taiwan (Formosa)

Centrifugal electric motor-driven pumps. Various. Bids by April 25, 1958, to Central Trust of China, 68 Yen Ping Nan Lu, Taipei, Taiwan (Formosa). Ref. ESB/8925/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

South Africa

Eight portable air compressors. Type specified. Bids by April 25, 1958, to Chairman of Tender Board, P.O. Box 7784, Johannesburg. Ref. ESB/9037/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Taiwan (Formosa)

Excavators, crushers, vibrating screens, conveyors, hoists, drill spares, etc. Various and stipulated. Bids by May 12, 1958, to Central Trust of China, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). Ref. ESB/9248/58. Telephone inquiries to Chancery 4411, extension 354.

★

Longyear NV, Zeekant 35, The Hague, Holland, a manufacturer of Longyear Diamond Core Drills, mining equipment and diamond bits, seeks representatives or distributors in certain territories of Africa and the Middle East.

★

A long-term commercial agreement, a trade protocol, and a payments agreement between Italy and the U.S.S.R. were signed in Rome at the turn of the year. The agreements require Russia to supply varying amounts of low-grade anthracite, manganese ores, chrome ores, platinum and apatite concentrates until 1961, as well as pit timber and drilling equipment.

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In late January, 1958, a commercial agreement was signed between France and Poland to cover trade between the two countries to November 30, 1958. Under the agreement, France will export to Poland phosphates, silicon, iron ore, and Madagascar quartz. Poland will export to France coal, metallic arsenic, and mining timber.

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Mr. P. Brittlebank, manager of Joy Sullivan (Africa) (Pty.) Ltd., of P.O. Box 1538, Bulawayo, S.R., would be interested in acquiring the sole distribution for plunger pumps suitable for use with diamond drilling equipment, which Joy Sullivan manufacture. The required capacity is 1,200 g.p.h. at 250 lb. p.s.i. to 500 g.p.h. at 450 lb. p.s.i. Ref. ESB 8527. Telephone inquiries to Chancery 4411, extension 776 or 886.

★

Ajax Precision Manufacturing Co. Ltd., Toronto, wish to contact U.K. companies with a view to part manufacture and/or assembly or manufacture under licence in Canada. Production tools, dies, etc., precision machine parts, stampings. Ref. ESB/8706/58. Telephone inquiries to Chancery 4411, extension 776 or 866.

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Ministère de la Défense Nationale de Belgique require four groups of vertical-type electrically driven motor pumps of a pressure less than 10 kg. per sq. cm. Tender documents available May 10, 1958, on payment 100 Belgian frs. Applications by April 26, 1958. Ref. ESB/9099/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Metals and Minerals

The U.S. Tungsten Industry in 1957

The growing difficulties experienced by wolfram and scheelite producers throughout last year as a result of dwindling demand and steadily declining prices lend additional interest to the review of the tungsten industry in 1957, issued by the Bureau of Mines, United States Department of the Interior, even if this survey serves merely to fill in the details of a situation which in its broad outlines is only too well known.

Imports of tungsten ore and concentrate into the United States in 1957 totalled 7,069 s.tons (tungsten content), a decrease of 35 per cent over the previous year, and were the lowest since 1951. Of the total receipts, 89 per cent were supplied by Bolivia (1,167 s.tons), Brazil (1,026), Argentina (955), Canada (812), Australia (791), Republic of Korea (783), and Peru (780).

There is little encouragement to be derived from the statistics of consumption. Although United States consumption for the year was 6 per cent lower than in 1956, it was 9 per cent higher than the annual average of the ten years, 1947-56. Consumption of concentrate in December was equal to the average for the last six months and virtually equal to that of December, 1956. By the end of 1957 industry stocks had risen to 4,135 s.tons compared with 2,228 tons when the year began.

Total production of tungsten products for the year decreased by 16 per cent and consumption also by 16 per cent, as compared with 1956.

Consumption of tungsten products (including metal powder, scheelite, ferrotungsten, chemicals, and scrap) was in tool steel and other alloys (about 41 per cent), carbides (about 40 per cent), tungsten wire, rod and sheet (about 13 per cent), and miscellaneous uses (about 6 per cent).

It is noteworthy that United States domestic production of tungsten concentrate fell to 7,933 s.tons (60 per cent WO_3) from 15,509 s.tons in the previous year. The number of mines operating in January, 1957, is not known, but by the end of the year only five mines were in production.

Because of the tungsten surplus in recent years and the urgent need for better high-temperature materials in jet aircraft, missiles, and numerous more commonplace uses, tungsten research in 1956 and 1957 has placed emphasis on end uses.

Tungsten's long-term future is, of course, assured by the importance of this metal both to the steel industry and in the high-temperature field. How soon the tide will turn, however, is dependent primarily on a resumption of the upward trend in United States steel production. When this will materialize still remains a matter of guesswork, however informed.

Meanwhile, the outlook for the tungsten ore market in Europe can only be described as bleak. Not only is there still quite a heavy volume of Korean and Bolivian material on offer, but stocks in merchants' hands remain at depressingly high levels. An unsold parcel of Bolivian material reported to involve some 35 tons has been a factor contributing to the downward price trend on the London market. With demand generally slow, the price structure appears to be none too secure at the present time.

ALUMINIUM IN QUEENSLAND

The latest developments in Queensland's potential aluminium industry, based on the very large bauxite occurrence at Weipa, on Cape York Peninsula, are the taking of options by the Commonwealth Aluminium Corporation over the Blair Athol coalfield, where two companies operate open cut mines on a high-grade steam coal seam 60-90 ft. thick, under 30-60 ft. of overburden. Coal requirements of the enterprise will be about 3,000,000 tons per year, and reserves are put at 100,000,000 tons.

It is thought that a power plant will be built at Blair Athol and that the aluminium smelter will be erected at a port, probably Mackay. Two sites are possible for the production of alumina: either on the deposit at Weipa, or at the port near the smelter. In the latter case, crude bauxite would be shipped in barges from Weipa to the smelter site. Investigations into these aspects will take some time.

COBALT'S TECHNICAL FUTURE

World production of cobalt decreased to about 15,500 s.tons in 1957 and reversed a seven-year uptrend, according to the Bureau of Mines, United States Department of the Interior. Production was 3 per cent less than in 1956, but was the second highest recorded. Outputs were larger in Canada, Northern Rhodesia, and the United States, but these gains were more than offset by smaller production in the Belgian Congo and French Morocco.

According to the Cobalt Information Centre, Brussels, the technical future of cobalt seems to lie more than ever in the high-temperature alloy field. Expansion of cobalt alloys is expected in uses where thermal shock, hot wear, hot hardness, and non-galling properties are required.

New cobalt-base alloys are being developed in the United States, France, and Britain, while the different grades of "Stellites" show their outstanding qualities in a great number of countries and applications. Weld-depositing of stellite for hard-facing applications is becoming increasingly important as the processing techniques are developed.

In magnets, the use of Alnico alloys is steadily being extended. Cobalt is irreplaceable in the field of magnets operating at variable temperatures, for which there is an increasing demand for precision instruments.

The use of cobalt for electroplating has not yet been fully exploited. A number of companies have manufactured bright Ni-Co deposits showing outstanding wear and corrosion resistance; this application may be largely extended in the coming years.

The use of cobalt as a catalyst is steadily increasing, while the metal's market in driers and other non-metallic compounds is holding its own.

TITANIUM PRODUCTION RISES

The Business and Defence Services Administration has reported an improvement in the United States titanium industry during January, 1958. Production of titanium ingot during that month increased to 324,825 lb. from 116,815 lb. in December, while production of mill products rose to 415,744 lb. from 190,981. Output in both categories, however, was still well below that of January, 1957.

Representatives of the United States titanium industry have expressed opposition to an Air Force proposal under which the Federal Government would make some of its stockpile of titanium sponge available to fabricators. The aim of the plan is to reduce the cost of titanium sponge to fabricators, thereby promoting increased use of the metal. Representatives of the industry were doubtful, however, as to whether this plan would, in fact, reduce the cost of titanium, and feared that it might result in further damage to titanium, which is already suffering from last summer's stretch-out in aircraft production. Most makers of titanium sponge were recently operating at 30 to 50 per cent of capacity.

*

There are no signs yet of a reversal of the persistent downward trend in Australian rutile, shipment prices of which are now indicated in London at £38-£40 per ton c.i.f. for minimum 95 per cent material, compared with £39-£41 recently. Fresh demand on both sides of the Atlantic is still very slow to revive, since most consumers are reported to be well covered under contracts for the next two years or so. These contracts were entered into some time ago and were a factor in the steep rise in prices to well over £100 per ton. Prices now appear to have virtually reached a level at which supplies from other than established producers are likely to dry up. Whether this would have any strengthening effect on the price structure, however, remains to be seen, having regard to the running contracts with many users.

CUBAN NICKEL PROJECT

Six major United States steel and motor car companies—all of them large nickel consumers—are lending financial support to Freeport Sulphur Co.'s Cuban nickel and cobalt project. They are reported to have advanced $25,250,000 to Cuban American Nickel Co., a Freeport subsidiary, which is building facilities at Moa Bay, Cuba, and Port Nickel, Louisiana, for the production of 25,000 s.tons of nickel and 2,200 s.tons of cobalt a year. Production is scheduled to begin in the summer of 1959. Cost of the entire project is estimated at $119,000,000. A

group of banks has agreed to lend up to $75,000,000.

The car and steel firms have entered into contracts with Cuban American which commit them to buy substantial amounts of nickel under certain conditions and under which they have the right to purchase additional amounts. The announcement of these contracts comes at a time when this metal has ceased to be scarce, and is a reminder that, whatever the immediate situation, the long-term problem of the nickel industry remains one of ensuring adequate supplies.

★

Surveys on nickel deposits and phosphates are being carried out in Papua, New Guinea, and adjacent areas.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

Trading has been quiet and generally featureless this week. The tone of the copper market continues very steady, whilst forward tin values have once again slipped below the cash support level.

U.S. COPPER STOCKS SHARPLY UP

There are no signs of a settlement being reached in the Chuquicamata strike, now in its third week, although some reports suggest a softening in the attitude of the workers as the strike has lasted longer than originally calculated. To date, the loss of metal involved is about 11,000 tons and Anaconda has invoked the *force majeure* clause in contracts with its customers. Subsequently, New York sources suggested that the company was planning to partially offset the effects of this by shipping copper from the United States to Europe. No indication was forthcoming of what tonnage might be made available, but in any event there has been no noticeable broadening in European demand.

Labour unrest is also evident in the Rhodesian Copperbelt where, as the world's third largest source of supply, output in 1957 is estimated at just under 450,000 s.tons. The dispute, which is not considered likely to result in strike action, concerns proposals by the companies to trim costs by cutting out certain uneconomical work practices.

From the U.S. come reports of activity in connection with the reimposition of the currently suspended import duty on copper now, rather than as from June 30, when the suspension is due to end. Such action is understood to have the backing of the administration, but their attitude is unknown towards other proposals to introduce a tariff of 4 c. per lb. when the price is below 30 c., and no duty above this level. Figures published during the week show that the voluntary production cutbacks in the United States have as yet failed to achieve the required effect.

Production of crude copper in March at 98,492 tons was 5,000 tons higher than February, whilst domestic deliveries were 15,000 tons lower. Stocks in the United States at the end of March were 37,400 tons higher than a month earlier, although world stocks were lower by 14,000 tons.

United Kingdom stocks in official Metal Exchange warehouses showed a decrease of 122 tons to 18,165 tons as at April 12.

MORE BUFFER STOCK BUYING

Additional to the easier tone in the East and generally quiet demand, the tin market has been subjected to a certain amount of selling pressure and the buffer stock manager has once again had to take in cash metal to maintain the floor price at £730. It will be recollected that in addition to the original funds made available to him, the manager can draw on a Special Fund which was established at the time of the last meeting of the Tin Council. No details of this fund have been made known, but it is no doubt sufficient for him to take up any surplus metal before the full effect of the 40 per cent export cut is felt.

The next meeting of the International Tin Council is on April 29, and this will provide an opportunity to study the workings of the restriction scheme. Under present circumstances it is unlikely that there will be any increase in the flow of metal from producing countries.

On Thursday morning the Eastern price was equivalent to £735⅞ per ton c.i.f. Europe. United Kingdom tin stocks for week-ending April 12 showed a decrease of 125 tons to 19,532 tons.

LEAD AND ZINC NO BRIGHTER

Interest in lead and zinc has been noticeably quiet. In the United States, premiums on special grades of zinc have been lowered, whilst the reduction in the lead price to 12 c. has failed to stir up any consumer buying. Sales for the week-ending April 9 amounting to 1,890 tons were, according to trade sources, the lowest ever recorded.

The rise in U.S. zinc stocks continued during March. Production for the month was 4,000 tons higher than February and stocks showed an increase of 14,500 tons.

Closing prices and turnovers are :

	Apl. 10		Apl. 17	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£175	£175½	£174½	£174¾
Three months	£176	£176½	£176½	£176¾
Settlement	£175½		£174¾	
Week's turnover	8,500 tons		7,275 tons	
LEAD				
Current ½ month	£72½	£72¾	£73	£73¼
Three months	£72⅝	£72¾	£73	£73¼
Week's turnover	2,375 tons		2,225 tons	
TIN				
Cash	£731	£733	£730	£730½
Three months	£731	£732	£729½	£730
Settlement	£733		£730½	
Week's turnover	490 tons		1,020 tons	
ZINC				
Current ½ month	£61½	£62	£62⅜	£63
Three months	£62	£62½	£62½	£63
Week's turnover	6,575 tons		3,800 tons	

LONDON METAL AND ORE PRICES, APRIL 17, 1958

METAL PRICES

Aluminium, 99.5%, £180 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £190 per ton
Crude (70%) £190 per ton
Ore (60%) basis 19s. 6d./20s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 10s. 0d. lb.
Cerium (99% net), £16 0s. lb. delivered U.K.
Chromium, Cr. 99% 7s. 2d. lb.
Cobalt, 16s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 8d. per gram
Gold, 249s. 2d.
Iridium, £26 oz. nom.
Lanthanum (98/99%) 15s. per gram.
Manganese Metal (96% - 98%) £310
Magnesium, 2s. 5½d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £20/£22 oz.
Osmiridium, nom.
Palladium, £7 10s. oz.
Platinum U.K. and Empire Refined £26 10s. oz.
Imported £22½/£23½
Quicksilver, £77/£78 ex-warehouse nom.
Rhodium, £40/£42 oz.
Ruthenium, £15/£18 oz. nom.
Selenium, 50s. 0d. per lb.
Silver, 76½d. f. oz. spot and 75¾d. f'd.
Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth .. 65% 8s. 6d. lb. c.i.f.
18/20% 1s. 3d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (semifriable) 48% .. £17 5s. 0d. per ton c.i.f.
" Hard Lumpy 45% .. £18 0s. 0d. per ton c.i.f.
" Refractory 40% .. £12 5s. 0d. per ton c.i.f.
" Smalls 44% .. £16 5s. 0d. per ton c.i.f.
Baluchistan 48% .. £12 0s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade .. nom.

Fluorspar—
Acid Grade, Flotated Material .. £22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2) .. 156s. 0d. ex works

Lithium Ore—
Petalite min. 3½% Li_2O .. 47s. 6d./52s. 6d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O .. 47s. 6d./52s. 6d. per unit f.o.b. Beira
Ambigonite basis 7% Li_2O .. £26 5s. per ton f.o.b. Beira
Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. £21 0s./£22 0s. d/d
Manganese Ore Indian—
Europe (46% - 48%) basis 67s. 6d. freight .. nom.
Manganese Ore (43% - 45%) .. nom.
Manganese Ore (38% - 40%) .. nom.
Molybdenite (85% basis) .. 8s. 5d. per lb. (f.o.b.)

Titanium Ore—
Rutile 95/97% TiO_2 (prompt delivery) .. £39/£40 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2 .. £11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%) .. 85s. 0d./88s. 0d. per unit c.i.f.

Vanadium—
Fused oxide 90 - 95% V_2O_5 .. £10 per unit c.i.f.
Zircon Sand (Australian) (65 - 66% ZrO_2) .. £16 per ton c.i.f.

Mining Finance

General Mining Makes Amends

When, after paying 25 per cent on its £1 Ordinary for twenty years in a row, General Mining cut its distribution on 1956 earnings to 20 p.c., the price fell to as low as 50s. at one time. The subsequent gradual recovery to over 80s. reflected a confident anticipation that the 1957 dividend would be restored. This faith has now been justified. The final is 15 p.c., making 25 p.c., and the profit after tax is up by £399,277 to £1,374,745, a figure which on this occasion includes £55,442 from share dealing, against only £6,814 in 1956. As anticipated, there is no repetition of the abnormally heavy allocation for writing down investments that was required last year, the amount utilized for this purpose being £185,668 compared with £442,716. In consequence, investment reserve receives £250,000 whereas a year ago £150,000 was withdrawn from this fund.

Higher profits had been looked for from General Mining because of the increased dividends declared by several members of the group during 1957. An expansionist policy has been pursued during the past five years which made last year's dividend cut all the more surprising. In 1953 the Consolidated Rand Investment and Transvaal Mining and Finance undertakings were acquired, while in 1956 Mr. Jack Scott's Strathmore group was absorbed. This means that last year General Mining's dividend income will have benefited from higher or initial payments by such concerns as New Pioneer, Eastern Rand Extensions, Blinkpoort, West Rand Consolidated, Stilfontein and Buffelsfontein. Also there will have been little in the way of declining revenue from the less prosperous base-metal industry, as this company, unlike some of the other mining finance houses, has no important stake therein.

General Mining's earnings from the new gold mines of the Klerksdorp area should continue to expand and, if all goes well with the Kaffir market, hopes will probably grow that 1958 might at long last see the 25 per cent dividend ceiling payment broken through. Meanwhile, at 85s. cum the final payment, the yield offered on the 25 per cent rate is around 7 per cent, after allowing for double tax relief.

SAAIPLAAS ISSUE DETAILS

The full details have now been announced of the £4.8 million capital-raising plan for Free State Saaiplaas, the Gold Fields group company which is opening up the ground immediately to the north of the prosperous Harmony mine in the Orange Free State. This sum is designed to take Saaiplaas well on the way to production, now scheduled for the earlier date of July, 1960, at an initial milling rate of 50,000 tons a month, rising to 75,000 tons after the first six months and to 100,000 tons after a further year.

Shareholders registered on May 6 are to be offered one combined unit, comprising one convertible note and three shares, for every five shares held at a price of £2 per unit. This means that the three shares involved are being offered at the par price of 10s. and that the convertible notes are of 10s. nominal value. These notes will carry interest at 6½ per cent and will be convertible into shares between September 2 next and June 30, 1961, in the ratio of two shares for three notes, i.e. at 15s. per share compared with the current market price of 11s. 3d.

How to raise the further amount, possibly in the neighbourhood of £2.5 million, that will be required to reach the initial production target will be considered at a later date. The success and pace of progress in the meantime will be the deciding factors.

In view of the grudging attitude towards the Rhodesian Anglo American offer shown by the United Kingdom Capital Issues Committee, it is interesting that in the case of Saaiplaas, a potential gold mine still in the shaft-sinking stage, the C.I.C. has given full permission for the United Kingdom portion of the offer.

The issue will close on June 10. This is an intriguing date in relation to the factor that is likely to guide the near term market course of Free State Saaiplaas shares: namely, the striking of the Basal reef in the No. 1 shaft. This shaft cut the "A" reef (which was not expected to be economic in this area) in March at a depth of 4,925 ft. with low gold values. If the normal geological progression is followed, the Basal reef horizon—the main gold carrier—should occur some 450 ft. lower down at around 5,375 ft. If the March quarter rate of sinking is continued, this point should be reached during the first half of June, very near to the date for closing the new issue lists.

Nobody can, of course, say what sort of values are likely to be met with when the Basal is initially exposed. Of the two boreholes in this south-eastern part of the mine, one gave 911 in. dwt. and then 2,154 in. dwt. in a deflection; the other, 267 in. dwt. and lower values in three deflections. Any lucky strike could have quite an influence on the share market in June, although it might not occur early enough to have a bearing on the new issue result. In any event, the issue is to be underwritten.

The offer is contingent upon the passing of the necessary resolutions at an extraordinary meeting on May 2 to increase the authorized capital from £6,500,000 to £11,000,000. Present issued capital is £6,067,559.

PROSPECTS FOR "SALLIES"

The chairmen's reviews in the annual reports in one or two of the Rand mines in the Anglo American group have some points of interest, in particular that of Mr. H. C. Koch concerning South African Land and Exploration. This company's main interest is an old-established gold mine in the Far Eastern Rand which has now been going long enough to have passed into the medium-life class. In 1956, however, further ground to the south was acquired from Withok Proprietary. The potentialities of this area are now a major element in the outlook for "Sallies".

Mr. Koch says that the results obtained from reef development in Withok so far are "encouraging". They show that payable shoots exist. But exploration is in its early stages and reef tonnage estimates are not yet possible. Work in the next twelve months, Mr. Koch points out, will be of great importance.

In these circumstances, the results of reef development in Withok just announced for the first quarter of the current financial year are worth noting. Footage sampled remained modest at 880, but 72 per cent was payable, averaging 641 in. dwt. Both figures are well above those currently being obtained from the original mine. "Sallies" 3s. 6d. shares could become responsive if Withok continues to yield good results. At the present price of 21s., the return on the 3s. dividend paid for each of the past two years is 14.3 per cent without allowing for double tax relief.

FOOTWALL AT BRAKPAN

The Brakpan mine lies immediately to the north of that of "Sallies" (in which Brakpan holds 361,067 shares), so there is no possibility of any expansion southwards. But Brakpan, with 47 years of working behind it, is being sustained by a new reef, the Footwall. This carries some high gold values and these have brought the average of the mine's ore reserves up to 5 dwt. per ton in recent years. Mr. Koch, however, repeats a warning that has been given before. This is that the Footwall reef is massive compared with the other reefs of this district. Selective mining is thus difficult, and unpayable tonnage has to be taken out in order that payable reef is not lost. In other words, this particular reef must not be expected to have the favourable effect on gold recovery per ton of ore milled that development results thereon might appear to indicate.

Brakpan's capital expenditure is scheduled to be reduced sharply this year from 1957's £142,854 to around £10,000. At the same time, working costs are expected to benefit from the drawing of a greater proportion of the ore treated from surface dumps made possible by last year's re-commissioning of the sands section of the treatment plant.

Extracts from Mr. Koch's statements appear on page 452.

SPAARWATER LINGERS ON

Spaarwater Gold Mining has been extracting gold from the property lying immediately to the south-west of the Sub Nigel mine in the Eastern Rand since 1947. But it is no nearer paying a dividend now than it has ever been and the shares languish around 9d.

The annual report for 1957 holds out little hope that things will improve. Ore reserves are now 267,000 tons averaging 5.9 dwt. gold per ton over a width of 38 in. equal to 224 in. dwt. They represent just over two years' supply for the mill at the 1957 crushing rate of 126,600 tons. The profit from this was £8,980 and the accumulated loss is now £142,942. Net liquid assets are £132,854, equal to about 4d. per share.

Spaarwater's greatest chance now appears to have gone. That was the possibility, strongly mooted at one time, that it might be taken over by Sub Nigel. Shareholders' chief remaining hope is that operations can be continued on a break-even basis until the gold price goes up materially, although even this would not necessarily benefit the mine to any great extent in view of the area's spotty enrichment combined with large barren areas.

A CHEAP ENTRY INTO THE O.F.S.

At present prices, the 5s. shares of Lydenburg Estates provide a cheap way of acquiring an interest in three prominent O.F.S. producers — President Brand, President Steyn and Welkom. All three earn revenue from uranium as well as from gold, and all three are now in the dividend-paying category (although it must be remembered that the two Welkom payments to date have been in the nature of an unexpected present, for this company is not, at present, making sufficient profit to cover its capital expenses).

Welkom is represented in the Lydenburg portfolio by 133,240 shares, worth (at present prices) some £92,000. The holding of P. Brand amounts to 115,008 units, worth £282,000, and the 100,000 Steyn shares may be valued at £140,000 In other words, the value of Lydenburg's shareholdings at the present time works out at something like 14s. 9d. per Lydenburg unit, or in more simple terms, at the present price of about 11s. £1 invested in Lydenburg buys an interest of about 26s. in three promising mines divided up roughly in the proportions Welkom 4s. 8d.; Brand 14s. 2d.; Steyn 7s. 2d.

Market valuation is a useful indicator for capital appreciation; for income the investor is more interested in Lydenburg's revenue potentialities. Here too the company seems to be undervalued. On the basis of the last two dividends declared by the O.F.S. mines, Lydenburg's gross income in the year to June 30 next should amount to some £42,250.

Assuming that tax and other outgoings take a similar proportion of revenue as last year, this would suffice to pay a 9d. dividend against 3d. last year, Lydenburg's capital being extremely highly-geared. Admittedly, this would still represent a yield of only 6½ per cent, but no account has been taken of future dividend increases from the three mines, a most important fact in view of Lydenburg's low issued capital.

LONDON MARKET HIGHLIGHTS

The big event in the Stock Exchange world last week was, of course, the U.K. Budget. Mr. Heathcoat Amory's rather cautious tax reliefs stimulated a surprisingly large amount of interest in industrial shares, but contained little of interest to the mining shareholder.

The only proposal likely to affect the mining market is the decision to impose a flat 10 per cent profits tax rate. Previously, there were two rates: a levy of 3 per cent retained on profits and 30 per cent distributed on profits.

Thus the new proposals mean that a company which distributes its profits generously to shareholders will be better off with the 10 per cent flat rate, while the more conservative company which previously tended to hold earnings back will be less favourably placed.

Glancing through the mining share list it seems that very few mining companies stand to benefit. For one thing, most mines are incorporated overseas and thus do not pay profits tax anyway. Of those that are still U.K. registered, the majority escape or will escape this tax on their undistributed profits as a result of O.T.C. concessions.

Some of the Kaffir finance houses will, however, benefit. Notably Anglo French, which is not an O.T.C., is U.K. registered and has for many years paid generous dividends and thus has been penalized by the higher bracket of profits tax on these distributions. To a certain degree, Central Mining, Gold Fields, and Union Corporation will be helped. So would such companies as Rio Tinto, London Tin, British Tin Investment and Consolidated Zinc but for the fact that any saving these companies may make is likely to be more than offset by the fall in income from base metals.

In the circumstances then, last week's Budget left mining shares rather cold. Gold share dealers were far more concerned with the progress of the South African General Election—polling took place on Wednesday—and with the spate of quarterly reports that began to make their appearance.

As far as the election was concerned, it seemed to be progressing peacefully enough and thus did little more than subdue the market. The first of the batches of quarterly reports, however, were on the disappointing side, and it says much for the underlying firmness of the market—noted here in recent weeks—that this disappointment had very little effect on share prices which, with all things considered, could have been expected to react, at least to some extent.

Undoubtedly the severest knock for the bulls was the lack of high development results in the St. Helena quarterly report. Previously, high hopes had been running in both London and Johannesburg that this report would disclose astronomical gold values in the new No. 2 shaft area. In actual fact, the report mentioned a great deal of station-cutting activity in the area but did not give any gold values at all. As if this were not bad enough, the mine's normal development figures turned out to be mediocre. The shares promptly fell 1s. 6d. to 39s. 1½d., but recovered all of their loss —within 24 hours—on the view that the high values were there all right and it was only a case of waiting until the company announced them.

Another disappointment was in the Harmony return. For no very apparent reason a particularly good return was again expected and again did not eventuate. It is one of those inexplicable things that this optimism occurs regularly each quarter in front of the Harmony statement.

Otherwise, the market proceeded on a steady course with a quiet investment demand in the background. Most sections benefited to a modest degree and a resurgence of "break-up" talk, Johannesburg-inspired, lifted New Kleinfontein to 4s. 9d. and Modder B to 2s. 4½d. General Mining fulfilled hopes that the total dividend would be restored to the 25 per cent level and the shares accordingly moved up to 85s. 7½d.

Diamonds gained ground with the rather better—though still "delicate"—trend on Wall Street. Investment buyers seemed particularly interested in "Casts" in front of next month's interim dividend. These shares crept up to 13s. 1½d.

There was little to report in base-metal shares. Coppers continued to be swayed by the actions of Wall Street and the metal price, while Tins and Lead-zincs stayed in the doldrums. Messina issues seemed to be behaving strangely in front of the interim expected any day now, being remarkably firm in face of a generally anticipated poor payment. Elsewhere, Henderson's suddenly revived, rising to 8s. on vague take-over talk; the hitherto abortive interest of Messrs. Glazer Bros. in similar stocks such as London and Rhodesian and, it is said, Rhodesian Corporation was very much in mind. Meanwhile, it was realized that take-over or not, Henderson's pay nicely for their keep from their coal interests.

WANKIE FREIGHT RATE DOWN

The basic railway rate for export coal from Wankie Colliery to Lourenco Marques will be reduced by 10s. 3d. per s.ton with immediate effect, the Rhodesia Railways announced on April 2. The basic rate will be 37s. 6d. per s.ton instead of 47s. 9d. Last week, Wankie Colliery announced that its No. 1 Colliery would be put on a caretaker basis because of the lack of demand for coal within the Federation and the increasing difficulty of gaining coal export contracts in a highly competitive market. The railways say that with present traffic demands, they expect to be able to carry between 20,000 and 30,000 tons of coal to Lourenco Marques for export each month. Following the announcement, a spokesman for Wankie Colliery said that the company welcomed the reduction. It would enable the colliery to quote a more competitive price on the export market.

M.T.D. (MANGULA)

Due to a misprint, it was stated in these columns on March 14 that the revenue per ton (and hence the costs per ton, since the mine was stated to be breaking even) at M.T.D. (Mangula) was 17s. 7d. at the then current copper price of £165 per ton.

In fact, revenue per ton at this copper price is approximately £2 2s.

Blinkpoort Gold.—In his speech to shareholders of Blinkpoort Gold Syndicate, Mr. C. S. McLean, the chairman, disclosed that Blinkpoort exercised its rights to acquire a further 95,922 shares in F.S. Geduld early this year. Mr. McLean's speech appears on page 454.

Amalgamated Collieries. — Amalgamated Collieries of South Africa enjoyed a successful year in 1957, in spite of the transport difficulties common to the industry. After tax of £159,010, net profit came out at £765,648, almost £25,000 higher than in 1956: £100,000 was put to a reserve for future capital expenditure, while the unchanged dividend of 4s. per share absorbed £622,000, leaving £285,067 to be carried forward against £299,268 brought in. The circulated statement of the chairman, Mr. T. Coulter, is on page 453.

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA LIMITED

(Incorporated in the Union of South Africa)

Extracts from the Statements by Mr. H. C. Koch, Chairman of THE GROUP'S RAND GOLD-MINING COMPANIES

(All companies mentioned are incorporated in the Union of South Africa)

BRAKPAN MINES LIMITED

OPERATIONS at your company's mine resulted in a working profit for the year of £181,755, which is £15,932 more than that for the preceding year. During the year the capacity of the reduction plant was increased by the re-commissioning of the sands section of the plant, and as a result the tons milled at 1,354,000 were some 70,000 more than in 1956. The greater part of the increase was accounted for by the drawing of 54,422 tons from the surface rock dumps at No. 2 and No. 3 Shafts. The introduction of surface tonnage to the mill has contributed to a reduction in revenue per ton milled of 1s. 9.7d. to 41s. 0.0d., and, together with lower development costs, has resulted in the lowering of working costs by 1s. 10.9d. to 38s. 3.8d. per ton milled. In the current year a greater proportion of the ore milled will be derived from surface dumps, with a correspondingly beneficial effect on working costs.

Shareholders may be interested in the origin of the surface tonnage now being fed to the mill. This tonnage is derived from two sources: waste rock dumps, and the sands dump at No. 2 Shaft. In the years when the reduction plant at the mine was running to capacity, ore from development on reef that was then uneconomic to mill was sent to the waste rock dumps, where it became mixed with waste rock hoisted from underground and with rock carrying low values that came from the sorting belts. The waste dumps are, therefore, an agglomeration of rock from a number of sources, and because of their structure it is not possible to obtain a representative sample of a dump as a whole. Consequently no reliable estimate can be made of the payable tonnage remaining in the dumps.

In 1927 the throughput at the reduction plant was increased beyond the optimum limit of operational efficiency of the plant, and the material passing through the sand treatment section was not subjected to sufficient grinding, with the result that the sands coming from that section carried residues with a value of about 1 dwt. per ton. These conditions existed until 1938, when a flotation plant was installed which lowered the residues to approximately 0.3 dwt. per ton. The sand deposited on the dump is more homogeneous in character than the material in the waste rock dumps and can be more accurately sampled. It is estimated from the records that are available that approximately 3,000,000 tons of sand of about 1 dwt. per ton were deposited on the sands dump between 1927 and 1938. The payable sand is covered by varying thicknesses of unpayable material which is now being removed. Shareholders should realise that as yet no certainty exists that the whole 3,000,000 tons can be economically worked. However, the consulting engineers have concluded that there is a sufficient quantity of payable material available to warrant the re-commissioning of the sands and flotation sections of the reduction works in order to treat this material at a reasonable profit per ton.

Development footage achieved during the year at 48,129 ft. was 6,709 ft. less than in 1956. Of the footage sampled, 10,485 ft., or 28.3 per cent, were payable. Included in the total of payable footage sampled were 5,815 ft. on the Footwall Reef, the percentage payability being 30.1 per cent of the footage sampled, and the equivalent value on this reef of the payable percentage being 926 in. dwt.

In recent years the majority of the high development values have been obtained on the Footwall Reef and any dilution of ore derived from this reef affects the recovery value from the mine as a whole. The Footwall Reef is massive in character and is unlike the stratified narrow band of the Main Reef Leader. Consequently, different methods are employed to mine these two reefs. On the Main Reef Leader, selective mining is possible, but the massive nature of the Footwall Reef precludes a high degree of selective mining, and unpayable tonnage has of necessity to be stoped on occasion in order that payable tonnage will not be lost.

Capital expenditure for the year amounted to £142,854, as compared with the estimate of £100,000 in my review last year. Of this amount, £140,741 was incurred in connection with the sands and flotation sections of the reduction plant. It is estimated that during the current year the amount to be spent on capital account will be approximately £10,000.

The full effect of the increased pneumoconiosis charges under the Pneumoconiosis Act of 1956 are shown in the payments for the year at £91,179, an increase of £7,146 over the amount for 1956.

Dividends Nos. 89 and 90, totalling 9d. per share, were declared during the year.

SOUTH AFRICAN LAND AND EXPLORATION COMPANY LIMITED

DURING the year 1,072,000 tons were milled at your company's mine, which was virtually the same as the tonnage milled in the preceding year. The working profit at £725,711 was however, £86,313 less than in 1956, because of a falling off of 0.06 dwt. per ton in the yield and a rise in working costs of 10.7d. to 39s. 1.1d. per ton milled. On the other hand, the amount payable by your company to the Government by way of taxation, and in terms of the mining lease, was substantially smaller—being £109,676 less than in 1956—largely because of the allowance for tax purposes of capital development in the Withok property.

Development footage driven during the year in the lease area declined by 18,898 ft. to 26,581 ft., but the effect of this on the ore reserve was not severe, since the payability increased to 36.7 per cent. with a slightly higher average width of reef.

A start was made in 1957 with prospecting from the underground workings in your company's lease area into the farm Withok No. 7, and 13,880 ft. of development were advanced in the north-eastern portion of that farm. The greater part of this development footage was in an extension of No. 1 East incline. The extension of this incline passed through the tear fault, which lies on an east-west axis, about 2,400 ft. from the southern boundary of the lease area, and by the end of the year had reached a point some 3,600 ft. beyond the southern boundary. In the Withok property, 5,890 ft. were sampled, of which 2,030 ft., or 34.5 per cent. were found to be payable with an average value of 16.53 dwt. over an average width of 19.89 in., equivalent to 329 in. dwt.

The development footage driven and the results obtained are encouraging, but while they indicate the continuation of payable shoots into the Withok property, much exploratory work remains to be done underground before a reliable estimate can be made of the payable tonnage in the area. This is particularly the case in the area to the south of the tear fault where, however, the few intersections that have been made of the reef, in development and in underground boreholes, have shown assay results which are not without promise. Great importance attaches to the exploratory work to be done during the next twelve months, and the manner of exploitation of this area will depend on the amount of payable ground disclosed south of the tear fault.

The ore reserve calculated at the end of the year of 3,643,100 tons, with an average value of 5.64 dwt. over a stoping width of 42.97 in., showed a decrease of 123,000 tons compared with that at the end of 1956, the value being 0.19 dwt. lower, while the stoping width was 0.65 in. greater.

Expenditure on capital account during the year amounted to £178,410, of which £132,623 was incurred on equipment and development in the Withok property. The consulting engineers estimate that a total of £200,000 will be spent on capital account in 1958, including an amount of £170,000 for exploratory work on the farm Withok No. 7.

Dividends Nos. 38 and 39, totalling 3s. per share, were declared during the year.

SPRINGS MINES LIMITED

OPERATIONS at your company's mine resulted in a working profit for the year of £99,397, which is £25,632 less than that for the previous year. The fall in working profit has been brought about by factors that are to be expected on a mine approaching the exhaustion of its ore reserves.

The tonnage milled, at 1,510,000, was virtually the same as in 1956. In February, 1957, underground operations ceased at No. 6 shaft, and in order to maintain the milling rate, additional tonnage had to be taken from surface dumps. A total of 664,205 tons was drawn from this

source during the year, this being 160,826 tons more than in 1956. The milling of this additional surface tonnage has resulted in a reduction in the grade of ore milled, and hence a lower revenue, which at 27s. 10.5d. per ton milled is some 2s. 4.6d. less than in 1956. On the other hand, it has contributed to a reduction in working costs, which at 26s. 6.7d. per ton milled were 2s. 0.6d. less than in 1956. This is notwithstanding an increase in pneumoconiosis charges for the year from £87,743 to £103,854, equivalent to 1s. 4.5d. per ton. The combined effect of these factors has been to reduce the profit per ton milled from 1s. 7.8d. in 1956 to 1s. 3.8d. in 1957.

The margin of working profit is very small, and the mine continues to be most vulnerable to any drop in revenue or rise in working costs.

With all major development at the mine now completed, the greater part of the development work advanced during the year was of a secondary nature, for the splitting of blocks of payable ore and for re-development through faulted areas in preparation for stoping.

The payable ore reserve at the end of the year was estimated to be 1,965,000 tons, a decrease of 211,000 tons as compared with the ore reserve at the end of 1956. The grade of these reserves, at 4.29 dwt., was 0.27 dwt. less than the previous year. This estimate does not include the payable material available on surface dumps that is being fed to the mill. At the end of the year an estimated 2,335,800 tons from this source remained available. An accurate estimate of the average grade of this material is difficult to obtain, but it is probably less than 1 dwt. per ton.

Further sales of surplus property, plant and equipment during the year realized the amount of £38,296. In view of the reduction in the amount of working profit, no interim dividend was declared in June, 1957. A dividend of 4½d. per share was declared at the end of the year.

EAST DAGGAFONTEIN MINES LIMITED

THE tonnage milled at your company's mine during 1957 decreased by 11,500 tons to 1,128,500 tons, as compared with the preceding year. However, the working profit for the year at £413,813 was £9,642 more than in 1956. The increase in working profit was achieved in spite of a rise in working costs of 1.2d. to 34s. 4.1d. per ton milled and a slightly lower average gold price. These factors were more than offset by a small increase in yield from 3.29 dwt. to 3.31 dwt. per ton.

In my review last year, I referred to the decrease in development during the year, and I drew attention to the inevitable decline in the total development footage that would be driven in succeeding years because of the diminishing number of unstoped sections that remain to be developed. The declining trend of development continued in 1957, and on the Main Reef Leader 8,713 ft. were developed as compared with 9,709 ft., while on the Kimberley Reef 23,910 ft. were accomplished, which was 479 ft. less than in 1956. In total, 24,395 ft. were sampled on the two reefs. This was 1,440 ft. less than in the previous year, but the payable footage increased from 7,755 ft. to 9,265 ft., while the percentage payability improved from 30.0 per cent to 38.0 per cent. This improvement was due in the main to the results obtained on the Kimberley Reef.

The ore reserve, calculated at the end of the year, increased by 288,000 tons to 4,686,000 tons. The stoping width was 0.04 in. less at 36.64 in., and the stope value was 4.41 dwt. as compared with 4.49 dwt.

Capital expenditure on shaft sinking, development and equipment account amounted to £5,627 during the year. It is not expected that there will be any expenditure under this heading in 1958.

DAGGAFONTEIN MINES LIMITED

THE working profit from gold production for the year decreased by £129,638 to £3,247,332, as compared with 1956. However, there was an increase of £126,123 in the estimated profit from uranium and sulphuric acid production, with the result that the company's total profit of £5,026,518 for the year was only £3,515 less than in 1956.

The tonnage milled for the year increased by 81,000 tons to 2,718,000 tons. This was due partly to an increase in the supply of Native underground labour and partly to improved sorting arrangements at the north reduction plant.

Working costs at 30s. 10.2d. per ton milled were 3.9d. lower, but the effect of this was more than offset by a drop in the yield per ton, which at 4.35 dwt. was 0.16 dwt. lower.

In the uranium plant, a slightly lower tonnage was treated, but the yield improved by 0.027 lb. to 0.405 lb. per ton, which accounts for a corresponding improvement in the profit from uranium.

At your company's mine, uranium is produced as a by-product of gold mining. The ore is mined on the basis of its gold content, and there is no direct relationship between the gold and uranium contents of the ore. The tonnage treated in the uranium plant is derived both from current slimes coming from one of the gold reduction plants and from slimes drawn from old slimes dams. In all these circumstances, it can be appreciated that the monthly profits earned from uranium production can be subject to pronounced fluctuations from month to month.

The number of unstoped areas that remain to be developed is diminishing, and a decline in the annual development footage can therefore be expected. During the year, the total development footage achieved on the Main Reef Leader and the Kimberley Reef amounted to 29,042 ft. The comparable figure for 1956 was 32,479 ft. The decline in development footage without a corresponding decline in the high milling rate will lead to a decrease in the total of the ore reserves from year to year. At the end of 1957, the payable ore reserve was estimated to be 10,246,500 tons, as compared with 11,344,000 tons at the end of 1956. Included in the total of 10,246,500 tons were 4,134,000 tons on the Kimberley Reef, the average uranium value being 0.422 lb. per ton and the gold 6.22 dwt.

Funds appropriated for capital expenditure amounted to £494,268. This was made up of £434,278 in respect of the redemption of uranium loans and £59,990 on fixed assets.

Dividends totalling 5s. 3d. per share were declared during the year. This was 3d. per share less than for 1956.

AMALGAMATED COLLIERIES OF SOUTH AFRICA LIMITED

(Incorporated in the Union of South Africa)

INCREASED MINING PROFITS

The following extracts are from the Statement by the Chairman, **Mr. T. Coulter,** which has been circulated with the report and accounts.

The company directly controls three collieries: Cornelia, at Vereeniging; Schoongezicht, in the Middleburg district; and Springfield, near Balfour. The first two are owned by the company, while the last is operated by a subsidiary, Springfield Collieries Limited, of which your company holds almost the entire issued share capital. The other subsidiary, Largo Colliery Company Limited, is in the process of being liquidated.

In addition, the company has considerable interests in New Largo Colliery Limited, Blesbok Colliery Limited, and in Witbank Coal Holdings Limited.

Accounts

A modest overall increase in the mining profits of the company's collieries and from dividends brought the gross profit from £931,586 up to £963,704. The net profit of £924,658 shows an increase of £32,178 over the previous year.

Provision for taxation was £159,010, leaving profit after taxation at £765,648, as compared with £741,428 for the previous year.

Other appropriations include £56,830 for normal capital expenditure, which is also the amount by which fixed assets have been augmented during the year, and £100,000 for future capital expenditure, making a total of £156,830 as compared with £274,484 in 1956. Normal capital expenditure in 1957 included the cost of sinking a new ventilation shaft at Schoongezicht, together with the installation of a large capacity ventilating fan. Appropriations in respect of future capital expenditure are being made now as a provision against a number of capital items under consideration at both Cornelia and Schoongezicht.

Dividends have been paid at the unchanged rate of 4s. per share for the year, absorbing £622,000 and leaving £285,067 to be carried to the balance sheet as unappropriated profits.

Current assets, excluding stores, are valued at £939,214 and exceed current liabilities and provisions by £181,531, showing a satisfactory liquidity.

Coal Mining

CORNELIA COLLIERY: Cornelia is still the largest coal producer in the Union and is responsible for 9.6 per cent of the total Union output.

Sales in 1956 were adversely affected by the temporary removal from service of three faulty generating sets at the pithead Vaal Power Station. While deliveries to Vereeniging Power Station were not disturbed and some of the surplus was absorbed through the sales agency of the Transvaal Coal Owners Association, it was not until the generating sets came back in operation during 1957 that the position was properly redressed.

The gross mining profit for 1957 was £438,875, as compared with £447,561 for the previous year.

SCHOONGEZICHT COLLIERY: This col-

liery, situated in the Eastern Witbank field, has taken a little time to recover from the effects of the disaster which occurred in October, 1956, when an underground explosion of firedamp caused a number of fatalities.

Pending completion of a new ventilation shaft and installation of a large-capacity ventilating fan, mining operations were severely restricted by the Mines Department. Consequently, the average monthly output for the first half of 1957 was only 56,963 tons, against an average of 70,136 tons for the second half of the year.

The total sales output for 1957 was 762,597 tons and the mining profit £173,660, as compared with 824,575 tons and £156,967 respectively for the previous year.

The apparent increase in profits is due to the settlement during 1957 of the insurance claim which followed the explosion in October, 1956. Profits in 1957 are thus virtually in respect of 15 months' operations.

SPRINGFIELD COLLIERIES LIMITED: This large producer supplies the Klip Power Station of the Electricity Supply Commission. Sales output for 1957 amounted to 2,015,590 tons as against 2,097,338 tons for 1956. Net profit after taxation was £221,709 as compared with £221,135 in 1956.

BLESBOK COLLIERY LIMITED: This company produces blend coking coal for the South African Iron and Steel Industrial Corporation Limited (Iscor) and for certain municipal gasworks. The sales output was raised in 1957 from 617,636 to 622,449 tons, and the net profit after taxation from £135,924 to £139,302. Arrangements have been made for the entire output of the colliery to be sold to Iscor, and the company's gas coal quota will be transferred to an associated company. The company paid dividends totalling 10d. per share as against 9d. per share in 1956.

NEW LARGO COLLIERY LIMITED: This company's colliery and Wilge Power Station were planned as complementary undertakings, coal being delivered direct into the station bunkers by conveyor belt.

New Largo also supplies the coal requirements of the Electricity Supply Commission's Rand Power Stations.

A second colliery, called "B" Winning, has been opened and equipped in the northern section of the coalfield in readiness for increased demand, which is expected later in the present year.

The sales production for the year ended June 30, 1957, was 1,286,082 tons (1956, 1,285,963 tons) and the net profit after taxation £149,149 (1956, £137,596).

Dividends totalling 9d. per share (1956, 8d.) were declared for the year under review.

WITBANK COAL HOLDINGS LIMITED: The net profit after taxation in 1957 was £19,914, compared with £20,738 in 1956. Dividends totalling 2s. 3d. per £1 share were declared during 1957.

Coal Price

Since the last increase in price was granted by the Price Controller in November, 1955, there has been a steady increase in production costs throughout the industry, and the whole of the benefit then obtained has virtually disappeared.

It is therefore clear that consideration must be given to an increase in the controlled pitsmouth price of coal, and approaches have already been made by the industry to the Price Controller.

BLINKPOORT GOLD SYNDICATE LIMITED

(Incorporated in the Union of South Africa)

CHAIRMAN'S STATEMENT

The Chairman of the company, **Mr. C. S. McLean,** in presiding at the 24th Annal General Meeting of Blinkpoort Gold Syndicate Limited, held on March 7 in Johannesburg, referred to the substantial increase in the income for the year, which had been due mainly to the accrual of the Free State Geduld Mines Limited maiden dividend of 1s. per share. Administration costs, interest paid and provision for taxation had declined by a total of £1,000 and the surplus for the year was £111,295. Of this amount dividends declared had absorbed £109,375—leaving £1,920 and a small over-provision for taxation for the previous year to be added to the unappropriated profits carried forward.

The company, subsequent to the financial year-end, had exercised its right to subscribe for 95,992 new shares in Free State Geduld Mines Limited at 80s. per share. The purchase of the shares had been financed partly from a loan repayment received from Free State Geduld and partly by short-term loan facilities from General Mining and Finance Corporation Limited, to be repaid in due course when further loan repayments were received from Free State Geduld.

Mr. McLean, in referring to the Report of Free State Geduld Mines Limited for the quarter ended December 31, 1957, quoted the following operational details of the mine:

Tons milled	190,000
Oz. fine	134,333
Yield per ton (dwt.)	14.14
Cost per oz.	112s. 2d.
Revenue per ton milled ...	176s. 6d.
Cost per ton milled	79s. 4d.
Profit per ton milled	97s. 2d.

The total revenue for the quarter was £1,676,621, while working costs had amounted to £753,609—leaving a working profit of £923,012.

He mentioned that the Chairman of the Free State Geduld company, in his address to shareholders at the Annual Meeting, held on January 30, reported that at No. 1 Shaft 235 ft. had been sampled between January 1 and 24, of which 85.1 per cent had proved payable at an average value of 1,224 in. dwt., compared with 678 in. dwt. in the December, 1957, quarter; that in the No. 2 Shaft area 620 ft. had been sampled during the same period, of which 100 per cent had proved payable at an average value of 1,814 in. dwt., as compared with 1,519 in. dwt. for the December quarter; and that the average value for the mine had improved to 1,670 in. dwt. when compared with the average of 1,153 in. dwt. for the December quarter.

He also drew attention to the further statement by the Chairman of the Free State Geduld company that, to obtain geological information as to the structure of the ground in the western portion of the lease area, diamond drilling had been undertaken at various points in the 47 haulage south-west of the No. 1 Shaft; that where reef had been intersected in the boreholes the values had been very encouraging, varying from 1,500 in. dwt. to 3,000 in. dwt.; that the reef had been shown to lie in the dome between the 47 and 49 levels due west of No. 1 Shaft, whilst to the south-west reverse faulting had thrown the reef up to 45 level and higher; and that development was proceeding on 45 level to exploit the reef in this area—although some time would elapse before these operations were sufficiently advanced to permit stope tonnages to be drawn in any appreciable quantity.

Mr. McLean stated that in his view the developments referred to at the Annual Meeting of the Free State Geduld company might be regarded as most encouraging, and he thought shareholders of the Blinkpoort company could be well pleased that its portfolio contained such a large interest in that very promising new gold mine.

Publications Received

The principle of the influence of geological structure on the occurrence of ore was established in the inter-war decades and has proved to be extremely fruitful in mineral exploration and mine development. A formidable array of case histories was published by the Canadian Institute of Mining and Metallurgy to mark its golden jubilee in 1948, and the first-named of the two volumes under review, *Structural Geology of Canadian Ore Deposits: Vol. II*, is a sequel in the same manner, covering in the main new discoveries since that date. It multiplies instances rather than establishes new principles, and is of little interest except to the specialist.

★

The second work, *Canadian Industrial Minerals*, is the first comprehensive account of Canada's industrial minerals and is for that reason alone an important publication. Thirty-eight materials, mostly minerals, but including a few rocks of engineering importance, such as limestone, are given authoritative coverage on a scale roughly proportional to their individual contribution to Canada's mineral economy. The book is well produced and copiously illustrated, and contains much of interest to the general as well as the specialist reader.

★

The 1958 edition of the Directory of *British Rubber Manufacturers and Products* provides a complete buyers' guide to the British rubber industry in English, French, German, and Spanish. It is published by the Federation of British Rubber and Allied Manufacturers, and is free to overseas importers of rubber products. A limited number are also obtainable from the Federation offices, 43 Bedford Square, London, W.C.1, at 25s. per copy (postage and packing 3s.).

★

A notable increase in the value of Queensland's mineral production is recorded in the annual report of the Under Secretary for Mines for 1956. The total value of the State's mineral output in 1956 rose to £37,116,724, being an increase of £5,814,118 over the figure for 1955. The report emphasizes the importance of rehabilitating the gold-mining industry in Queensland as soon as possible.

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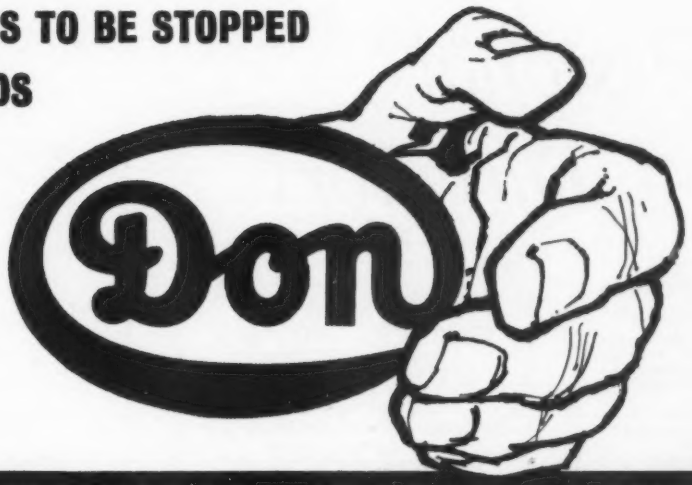

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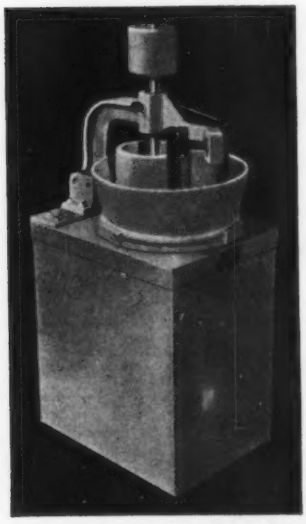

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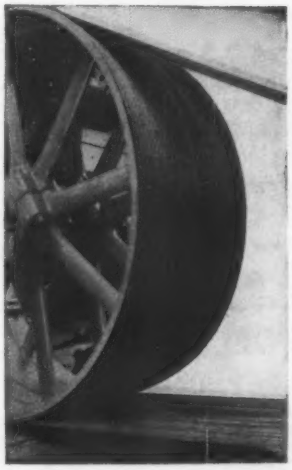

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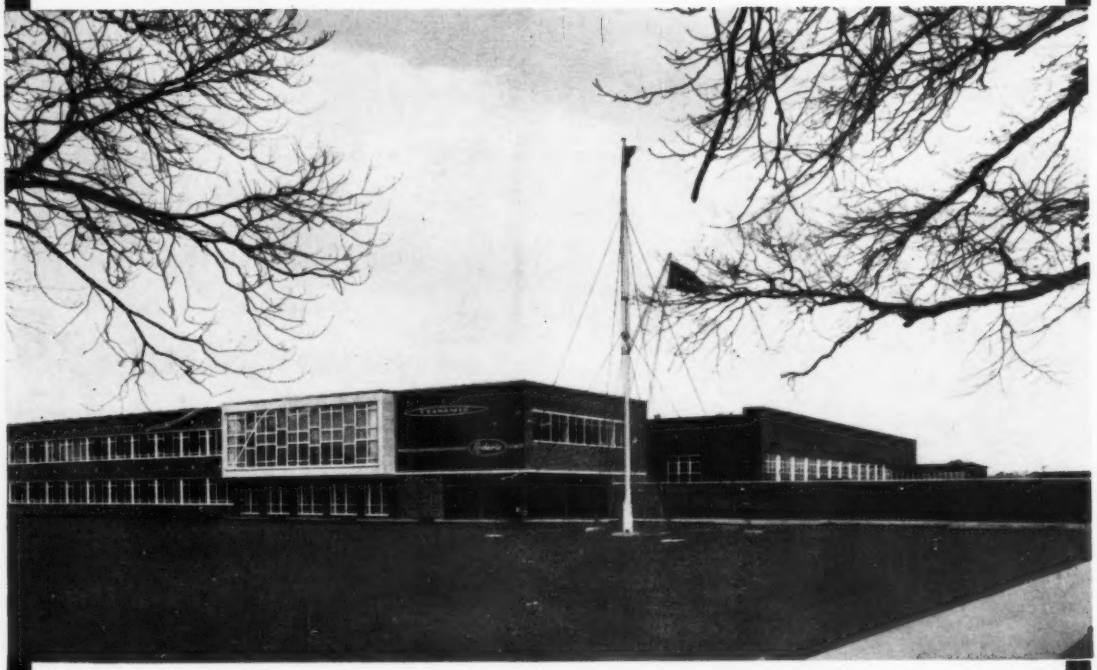

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